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WITH A

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THE RELATIVE TRANSFER EFFECTS OF SUPERVISED PLAY AND FORMAL GYMNASTICS[1]

CONSTANCE E. DOWD AND ADA HART ARLITT

Psychological Laboratory of the Vocation Bureau and Central Clinic, Cincinnati, Ohio

This investigation, begun in June, 1923, and completed in August of the same year, was undertaken in an attempt to determine the relative effects of a daily period of training in formal gymnastics versus the same amount of time spent in supervised play.

While there have been exhaustive studies of the extent and direction of the transfer of training in many fields, the only study which deals with the same problem as our own, namely transfer in the field of formal gymnastics, is an investigation made by Williams.[2] Williams' subjects were children from two fourth grades in the Horace Mann School.

Two groups were selected that were equal in mental ability, that is, the median intelligence quotient for one group was 114 while that for the other was 113. The range in intelligence quotients for the one was from 96 to 148 while that for the other was from 100 to 146. These groups were then equalized for motor ability, posture and growth and development as tested by the tests listed below. An obedience test of Williams was also given to the group The final equalized groups had 14 in each group for tests of skill, 18 in each group for the obedience test and from 16 to 19 in each group for the growth and

[1] Read before Section Q of the American Association for the Advancement of Science, January 1, 1925.

[2] Williams, J. F. A Comparative Study of Formal Gymnastics and Play for Fourth Grade Children. Teacher's College Record, Vol. XXIII, September, 1922, pp. 327-360.

development tests. The tests are listed by Williams as follows: height, weight, and lung capacity, measured in the usual manner, girth of chest normal and expanded, strength of right forearm and strength of left forearm, Creek (a test of William's own which is too long to describe but which involves mainly balancing), Bean Bag (throw), Thrusting (aiming) Stilts, Balance Beam, and two so-called tests of Alertness which involved crossing out dots and crosses.[3] After the groups had been equalized the experimental group was given two periods weekly of formal gymnastics for a period of eight months. The control group spent the same amount of time weekly in plays and games. As the same instructor worked with both groups the groups did not receive the training at the same hour of the same day. At the end of the training period the initial tests were repeated. The means of the gains for the play and game group were larger than those for the formal gymnastics group in all tests but three, chest expansion, strength of left forearm and thrusting. The difference on the whole favored the play and game group but there was practically no reliability of the difference for any tests but alertness. Williams used McCall's Expermental Coefficient $\left(\frac{\text{difference}}{2.78 \times \text{S. D. difference}}\right)$ as a way of expressing reliability. The average Experimental Coefficient for all of the tests listed except posture and obedience is 0.30. That is to say the difference in favor of the play and game group is 0.30 as large as it shoud be in order to be practically certain that the methods used for the play and game group were better than those used for the formal gymnastics group. There seemed to be no marked transfer to posture. In obedience as measured by Williams' test the play group improved more than did the formal gymnastics group. The Foster heart test seems also to have been used but the results from this test were not treated fully.

Our experiment differs from that of Williams in that: (1) The conditions under which our tests were given were some-

[3] The parentheses are the writer's.

what more controlled; (2) the training periods for our groups occurred at the same hour of the day; (3) the tests used in our experiment differed from those used by Williams in many instances; (4) the hygiene of rest, sleep and nutrition which Williams speaks of as being difficult to control were as completely controlled as was possible for a normal group. The routine activities of the day, the hours of sleep and rest, the amount and kinds of food given to the subjects and the kind and amount of exercise taken were kept equal as nearly as possible for all subjects. (5) Our subjects received intensive training for five weeks while in Williams' experiment the training was given in regular school periods, we presume twice a week, for the school year. The subjects used in the present study were thirty-five girls living in a summer camp in Maine. The subjects ranged in age from 7 to 18. The median chronological age for both groups was 13.22.

The following procedure was used to divide the total group into two equal groups. The Pintner Non-Language test was given to the group as a whole. All subjects received this test on the same afternoon. Nineteen tests of motor ability were also given to the whole group but these were administered individually. The tests of motor ability were chosen with a view to selecting two groups which would be equal at the outset of the training period in the measurable activities on which formal gymnastics is said to have a noticeable effect, namely, speed, accuracy or precision of movement, kinaesthetic discrimination, balance, strength, and general bodily coordination.[4] As tests of speed we used the Woodworth and Wells cancellation test, card sorting, rate of right and left hand tapping (with the ordinary tapping board), and a 75-yard dash. For Kinaesthetic discrimination we used twenty 2-inch cubes weighted with shot to vary from each other by 0.5 gram. The lightest weight weighed 20 grams the heaviest weighed 30 grams. The

[4] The tests are listed under these headings largely as a matter of convenience. Though functions other than those under the headings under which they are subsumed are also involved.

constant was the middle weight. The subject was blindfolded and the constant and the variable were presented. The order was varied to prevent any tendency on the part of the subject to select the weight in accordance with the order in which it was presented. The difference between the constant and the variable was increased until the subject could choose the heavier of the two correctly 8 out of 10 times. The same procedure was followed with the constant and the series of weights decreasing in heaviness until the subject could choose the lighter weight correctly 8 out of 10 times. The procedure was repeated in each direction going from the lightest weight to one which could just be discriminated as lighter 8 out of 10 times and from the heaviest weight to one which could just be discriminated as heavier 8 out of 10 times. For balance we used a balance line similar to a walking boom and hopping in circles with increasing distances between the circles. The circles were one foot in diameter and varied in distance from each other from 3 inches to 2 feet 6 inches. The subject's score on the balance line was computed on the basis of the distance traversed without loss of balance, her score on the circles was the actual number of circles into which she could hop without loss of balance or touching the line which marked the outside edge of the circle. There were 10 circles in all and the distances between the circles were increased by three inches each starting from the first circle which was just 3 inches from circle 2. Circle 3 was 6 inches from circle 2, circle 4 was 9 inches from circle 3 and so on. For bean bag throw, the first test of accuracy or precision of movement, we used 5 concentric circles. The outside circle was 5 feet in diameter, the next was 4 feet, the next 3, the next 2 feet and the inside circle 1 foot in diameter. The subject stood 10 feet from the line marking the outside circle and threw 5 bean bags. All bags thrown into the innermost circle gave the subject a score of 10, those in the next circle scored 8, in the next 6, the next 4 and the outside circle 2. The subject's score was the total score made with the five bags. Target aiming with a fencing foil was also used as a test of precision. The subject stood at a distance of

4 feet from a target consisting of 5 concentric circles differing from each other by 2 inches in diameter. The outside circle was 10 inches in diameter, the inside circle was 2 inches in diameter. The score for touching within the radius of a circle differed from 10 points for touching the inside circle to 2 points for touching the outside circle. The circles were different colors in order to make it easy for the subject to differentiate between them clearly.

As the strength test we used the hand dynamometer. The score on this was the better of two trials with each hand. As tests of general bodily coördination we used Baseball Throw for distance, Basket Ball Throw for distance, Hop, Step, and Jump, Running High Jump, Standing Broad Jump, and Running Broad Jump. We also determined the vital capacity of each subject by the use of a Wet Spirometer.

The nineteen tests described above were given to the whole group during the first week of camp. They were given to each individual in a prescribed order and the time of day and the conditions under which the tests were given were kept constant for the group, and noted down in order that the series given at the end of the training period should be given under the same conditions as the initial tests.

When all of the test scores were in, a scale was devised for each test which would give scores that could be added and averaged for all of the 19 tests. On the scale for each the highest score was rated 100 and the lowest score was rated zero. The intermediate scores were rated according to their position on the scale. If L equals the lowest raw score and R equals the range of raw scores, then the reduced score for any particular raw score S is represented by the following equation:

$$\text{Reduced score} = (S - L) \times \frac{100}{R}$$

That is, the lower limit of the range was taken as zero and the upper limit as 100 and each individual was given his proportional place in the range. A reduced score of 40 means that the

raw score was 40 per cent of the distance from the bottom to the top of the range.[5]

This method was chosen chiefly because of its simplicity and because all of the scoring had to be completed and the groups divided within ten days after the opening of camp. No attempt was made to weight tests as we have no data on which to base weighting of motor tests for children.

Reduced scores of all tests for each subject were averaged and this average was used as the final score for motor ability. The mental test scores were used separately as a second criterion for division. The whole camp was then divided in such a way as to distribute chronological ages, mental test scores and motor test scores as evenly as possible. The method of pairing was used as far as was possible with so small a group. Individuals were shifted about until the groups were practically equal in average motor test score, average mental test score, and average chronological age. The average scores for the group were as follows:

	FORMAL GYMNASTICS GROUP	SUPERVISED PLAY GROUP
Average motor score	55.61	54.52
Average mental test score	61.94	62.41
Average chronological age	13.22	13.23

[5] The formula actually used was $100 - \left(H - S \times \frac{100}{R}\right)$ where H = highest score. That is we began at 100 at top of range and measured down instead of beginning at the lower end of the range and measuring up. Both formulae are the same since $R = H - L$.

$$\begin{aligned}
\text{Reduced score} &= 100 - \left(H - S \times \frac{100}{R}\right) \\
&= 100\left(1 - \frac{H - S}{R}\right) \\
&= 100\left(\frac{R - H + S}{R}\right) \\
&= 100 \times \left(\frac{H - L - H + S}{R}\right) \\
&= 100 \times \left(\frac{S - L}{R}\right) \\
&= (S - L) \times \frac{100}{R}
\end{aligned}$$

Training was begun on the tenth day after the opening of camp. The Formal Group was given a twenty minute period of formal gymnastics every morning at 9:00 for a week and thereafter a thirty-minute period for four more weeks. That is to say, the class was held every morning except Sunday for five weeks. When a subject missed one of the weekday periods this was made up on Sunday morning. The exercises given were the regular Swedish System exercises as described in Enebuske's "Progressive Gymnastic Days Orders"[6] and in Skarastrom's "Gymnastic Teaching."[7] The theory of progression as set forth in Skarstrom was kept in view. In the opinion of the instructor the group showed marked improvement in execution and in ability to perform more difficult exercises by the end of the training period. The class was held out of doors in fair weather and in a large, well ventilated room in rainy weather.

Beginning on the same day and at the same hour the Supervised Play Group had play and games each day for the same number of minutes as the Formal Group had formal gymnastics. The periods were spent in playing games such as Dodge Ball and Relay Races and in performing stunts such as are described in Pearl and Brown in "Health by Stunts."[8] The stunts were performed in the most informal way, Each girl tried most of them but made her own choice as to which of them she would practice. Practice was thus to some extent introduced but it was in such a hit or miss fashion as to be in no way allied to drill of the formal period. As examples of the stunts the following are representative: chinning, push up, head stand, hand stand, hawk dive and balancing with chairs.

At the end of the training period the initial tests were repeated under the same conditions and in the same order as they had been given in the original series.

The results of each test are set forth in table 1. Gains in

[6] Enebuske, C. J. Progressive Gymnastics Day's Orders. Silver, Burdette & Co.

[7] Skarst. Gymnastic Teaching, Amer. Phys. Ed. Assoc., Springfield.

[8] Health by Stunts. Pearl and Brownin. MacMillan Co. 1921.

raw score are averaged for each group and the difference between the average gain for each group in each test is expressed in terms of the probable error of the difference. In each case where the Supervised Play group is superior to the Formal Gymnastics Group the number is preceded by a minus sign.

TABLE I

*Difference in average gains of experimental and control groups**

	AVERAGE GAIN		DIFFERENCE	P.E.	DIFFERENCE IN P.E. UNITS
	Formal Gymnastic Group	Supervised Play Group			
Cancellation	7.88	8.05	0.17	1.27	0.14
Card Sorting	4.50	4.79	0.29	1.42	0.20
Tapping, right	9.33	8.06	1.27	3.24	0.39
Tapping, left	1.22	6.16	4.94	3.99	1.24
Weight Lifting	−0.03	0.23	0.26	2.72	0.97
Balance Line	0.05	1.35	1.30	0.77	1.68
Bean Bags	−3.22	−7.29	4.07	1.86	2.18
Hopping	0.61	0.41	0.20	0.72	0.28
Target	2.94	3.05	0.11	1.20	0.09
Vital Capacity	4.11	2.41	1.70	2.21	0.77
Hand Grip, right	2.89	5.47	2.58	1.76	1.46
Hand Grip, left	0.61	2.41	1.80	1.37	1.31
Baseball Throw	−63.88	11.02	74.90	40.46	1.85
Basket Ball Throw	−6.11	16.76	22.87	15.36	1.49
Dash	0.00	0.08	0.08	1.34	0.61
Hop, Step and Jump	17.50	10.26	7.24	4.65	1.55
High Jump	3.94	3.35	0.59	0.77	0.76
Running Broad Jump	20.66	22.94	2.28	2.49	0.91
Standing Broad Jump	2.61	1.76	0.85	1.04	0.81

* For suggestions as to statistical procedure the writers are indebted to Professor R. S. Woodworth.

Gains are stated in terms of the unit of measure for each test, for example, in time for card sorting, in score for target aiming and in inches for the jumps.

In twelve tests the average gain for the Formal Gymnastics Group was less than that for the Supervised Play Group. These tests are Cancellation, Card Sorting, Tapping left hand, Weight lifting, Balance line, Target aiming, Right Hand Grip,

Left Hand Grip, Baseball Throw, Basketball Throw, 75 yard dash, and Running Broad Jump. The Formal Gymnastics Group was superior to The Supervised Play Group in Tapping, right hand, Bean Bag Aim, Hopping in Circles, Vital Capacity, Hop, Step and Jump, and Standing Broad Jump.

It is interesting to note the type of tests in which the Supervised Play Group showed superiority. In Basketball throw and Baseball throw, both of which are held to involve general bodily coördination, the Supervised Play Group was superior but in Bean Bag throw the formal Gymnastics Group made the better score. In weight lifting, a test involving kinaesthetic discrimination, and in card sorting which involves speed of perception and speed and accuracy of movement the Supervised Play Group were better than the Formal Gymnastics Group, though formal gymnastics is supposed to have a definitely beneficial effect in these directions.

Before going into a prolonged discussion of the differential effects of the two types of training the authors were interested to determine whether such differences as were found between the experimental and the control groups were reliable. The P.E. of the difference was computed for each test. A glance at the table will show that in the case of all tests except Bean Bag throw, and Hop, Step, and Jump which show a difference in favor of the Formal group and in Baseball throw, Basketball throw, and rate of Tapping with the left hand which show a difference in favor of the Supervised Play Group, the differences are so small as to be practically negligible.

After the tests had been treated separately all of the differences in P.E. units for all of the tests were averaged. The final score was the probable error of this average. This was 0.28 in favor of the Supervised Play Group. The P.E. of this average was 0.175 which shows that there is an even chance that the difference might be as small as 0.105 and there is some fair chance that the difference might be practically zero, or even that the Formal Gymnastics Group might show a slight superiority over the Supervised Play Group.

Lest it be said that our results are open to question because

the subjects used in this experiment were in camp and therefore exercising their muscles, and that formal gymnastics could therefore not be expected to have as much effect as if the children had been in a school where there was little opportunity for other exercise, we should state that the hypothesis is that formal gymnastics is of more value than other forms of exercise. It is well agreed that it is better than no exercise at all. If formal gymnastics have a better and a more specific effect than mere exercise, then one-half hour daily for four weeks following a period of twenty minutes daily for one week should have showed more effect than the same amount of time spent in play and games. All functions, and practically all muscle groups, which have been the subjects of transfer experiments have been in use in some other way while the transfer experiment was going on. Formal gymnastics is supposed to give certain definite effects, as for example increased precision of movement, which mere exercise does not give. These effects should have been obtainable whether the subjects were having other exercise or not.

The writers are not in a position to state to just what extent the improvement in either of the groups was due to the mere fact that the subjects were in a summer camp.

In view of the results of the experiment we should state that under the conditions of this experiment Formal Gymnastics given for a period of 20 minutes a day for a period of one week, followed by a period of one-half hour daily for four weeks produced no greater effect than the same amount of time spent in play and games. If anything the Play Group was slightly superior to the Formal Gymnastics Group but the difference is so small as to be practically negligibie.

TENDENCIES IN THE USE OF HEADLINES IN MAGAZINE ADVERTISING

C. J. WARDEN, W. A. RORISON AND S. B. SOLINGER

From the Psychological Laboratory of the University of Wisconsin

This report covers briefly the results of an investigation of headline usage in magazine advertising during the twenty year period beginning with the year 1900. The *Saturday Evening Post* was selected as the representative medium on account of its acknowledged leadership in the advertising field. An analysis of the headline was made for the years 1900, 1905, 1910, 1915, and 1920, the data for each year being compiled from the complete issues of the months of March, June, September, and December, taken as representative of the advertising practice of the year. The study naturally falls into two major divisions, the first dealing with certain mechanical aspects of the headline, and the second with the factors of content and form.

I. MECHANICAL FEATURES

Length of headline, length of words used in the headline, the kind of type used (whether upper or lower case) and the size of type used were the four mechanical features studied, and the data gathered will be presented topically in the above order. Only half-page and full-page advertisements were included in this survey.

1. Length of headline. Taking the period as a whole there seems to be no very marked or consistent tendency to shorten the headline, although the modal length of three words for the year 1920 is perhaps significant. The differences in range, average, or mode are less than one might expect from a casual inspection of advertising sections of the *Post* for the years concerned.

2. Length of words used in headlines. In order to determine whether or not the tendency among advertisers of the *Post* was toward the use of longer or shorter words in display lines, the letter units of each word were counted and the average

TABLE 1

Length of headline (number of words)

	1900	1905	1910	1915	1920
Range	3 to 8	1 to 8	2 to 11	1 to 16	1 to 10
Average	6	4	6	5	4
Mode	4	4	5	4	3

TABLE 2

Length of words used in headlines

	1900	1905	1910	1915	1920
Range (letters)	2 to 16	1 to 12	1 to 14	1 to 16	1 to 12
Average	6	5	4	4	4

TABLE 3

Use of upper and lower case type

	1900	1905	1910	1915	1920
	per cent	*per cent*	*per cent*	*per cent*	*per cent*
All—capital	30	25	10	8	4
All—lower case	20	5	5	2	1
Combination	50	70	85	90	95

TABLE 4

Size of type (in points)

	1900	1905	1910	1915	1920
Range of size	18 to 72	18 to 96	12 to 72	12 to 90	12 to 102
Modal size	30	36	36	32	36

computed. It is obvious from the accompanying table that shorter words were used, more commonly than longer words, throughout the period. Words of over 9 letters rarely occurred and monosyllable words were usually preferred, except when

the name of the product or firm was used in the display line. The average length of word employed in the headline decreased from six to four letters during the twenty-year period.

3. The use of upper and lower case in headlines. The classification includes the all-capital, the all-lower case and the combination upper and lower case headline. The latter class includes, for the most part, the capitalization of the initial letter of the first word, or of all the more important words of the headline. It will be noted that the straight upper and lower case headline has now been practically eliminated in the half-page and full-page advertisements of the *Post*, although both kinds were used rather extensively in 1900. The combination type of heading has come to be used almost exclusively.

4. Size of type. The point system was used in measuring the type and the values appearing in the accompanying table are in terms of this unit of type size. Type larger than 72 points is rarely found in the display lines of any magazine advertisement. There has been an increase in both the upper range and average since 1900, but not a very large one. The preference seems to be for the 36 point size, at present, with the 42 point size as second choice.

II. THE USE OF DIFFERENT CLASSES OF HEADLINES

In contrast to the mechanical features of the headline, the content and form are factors that may also be used as the basis of interesting comparisons. Following the classification suggested by Starch (Prin. of Adv., pp. 504–509) a survey was made to determine the relative frequency of the various types. The advertisements were first arranged according to size into four groups as follows: full-page (including double-page spreads), half-page, quarter-page, and smaller (from 1 inch to quarter-page). Each group was then analyzed as to content and form, and the classification reduced to the percentages appearing in table 5. The *Saturday Evening Post* was again used, exactly the same issues and years being selected as in the study of mechanical features, advertisements of all sizes being included in this case, however.

TABLE 5

The use of different classes of headlines

	1900	1905	1910	1915	1920
Full-page including spreads					
	per cent	*per cent*	*per cent*	*per cent*	*per cent*
Name of article	0	6	40	36	34
Name of firm	0	12	1	2	1
Selling point	0	12	24	27	30
Indirect heading	0	41	24	21	24
Blind heading	0	17	2	2	1
Command	0	6	5	8	6
Question	0	6	4	4	4
Half-page					
Name of article	100	70	29	16	40
Name of firm		0	2	1	0
Selling point		12	23	38	24
Indirect heading		12	32	28	24
Blind heading		6	2	2	1
Command		0	8	10	6
Question		0	4	5	5
Quarter-page					
Name of article	92	44	40	33	49
Name of firm	0	8	1	1	2
Selling point	0	8	21	19	24
Indirect heading	8	28	28	35	14
Blind heading		4	2	0	7
Command		4	6	9	1
Question		4	2	3	3
Smaller spaces					
Name of article	40	44	62	44	38
Name of firm	12	11	1	0	0
Selling point	20	13	12	32	6
Indirect heading	16	20	14	12	12
Blind heading	4	3	1	1	0
Command	5	6	5	8	29
Question	3	3	5	3	15

The name of the article advertised seems to have been used as the headline most often during this period, regardless of the size of the advertisement. The percentages show a considerable variation from year to year with no very definite trend.

Evidently the firm name was never very popular as a display caption, its use from 1910 and onward being almost negligible in the case of both large and small advertisements.

A fairly consistent increase appears in the use of an explicit selling point in the headings of advertisements of the quarter page size and larger. In the smaller size no trend is indicated.

The indirect heading stands next to the name of the article as a leader in display lines. On the whole 1920 registered a decrease in this type of heading by *Post* advertisers.

The blind heading has very properly grown less and less popular even in the case of the smaller advertisements.

The command and question forms held consistently throughout the period within the 3 to 9 per cent range for quarter-page advertisements and larger. However, a very large increase in the use of both forms, but especially the command, evidently occurred between 1915 and 1920, for the smaller spaces.

PERSONALITY DIFFERENCES IN INTELLIGENCE TEST PERFORMANCE

Group Individual Differences: The Significance of "Omissions"

GRACE E. MANSON

University of Michigan

INTRODUCTION

Psychologists, especially those who have concentrated upon standardizing and interpreting intelligence tests, are becoming more and more convinced of the fact that intelligence test scores need to be supplemented by other standardized measures if high correlations are to be obtained between test results and criteria of success. This need becomes especially urgent if the criterion is something other than academic grades. Witness the low correlations listed in many of the experiments where the criteria have been success in commerce or industry.[1]

On all sides there is a great demand for reliable measures of "character" and "personality" traits. Diligent researches are being made of methods of analyzing and measuring some of these seemingly elusive factors. The method of experimentation is in a measure determined by the trait under consideration. Written answers may be adequate for some traits, other motor activities as "tasks" may be necessary for other traits. For some time, at least, a battery of tests measuring the same trait will be more apt to give reliable results than any one test alone.

With the economy of time and subjects as a goal, the writer has been lured by the possibility of isolating and measuring

[1] Kornhauser, A. W., and Kingsbury, Forrest A., Psychological Tests in Business, The University of Chicago Press, 1924.

certain personality traits as demonstrated in intelligence test performance. This is neither an original nor startling purpose. Wm. M. Brown,[2,3] with the same aim in view, has attempted to isolate the "caution" factor in subjects taking the Thorndike intelligence examination for high school graduates, The Trabue completion test, the Otis examination, or a Binet test. Dr. Brown's paper is suggestive and valuable. The fact that this "caution" factor increases the predictive value of his regression equation for scholastic ability but little, is not evidence that his technique is poor or that "caution" is not a factor in scholastic standing, but rather that "caution" is but one of the many factors contributing to scholastic success. A truer measure of the reliability of his method of measuring "caution" would be obtained, as Dr. Brown suggests, if his "caution" indices were correlated with other measures of caution. But, unfortunately, other measures were not available.

THE PROBLEM

Early last year, the writer, having the same conviction as Dr. Brown, that much more information could be gained from the group intelligence test than the total score indicated, began working with Bureau of Personnel Research Test VI. This is a spiral omnibus adaptation of Army Alpha. There are in all 184 questions, 20 arithmetic, 40 opposites, 40 analogies, 24 true-false, 40 information and 20 number series. Questions are not weighted but those requiring more time, namely, the arithmetic, number series and true-false, are fewer in number: 20, 20 and 24, for arithmetic, number series and true-false, as against 40, 40 and 40 for opposites, analogies and information. Following the army scheme, errors on opposites and true-false are doubly penalized. In scoring, omissions

[2] Brown, Wm. M., A Study of the "Caution" Factor and Its Importance in Intelligence Test Performance, The American Journal of Psychology, 1924, Vol. 35, No. 3, pp. 368–386.

[3] Brown, Wm. M., Character Traits as Factors in Intelligence Test Performance, Archives of Psychology, May, 1923, No. 6.

on all tests count as errors but are not doubly penalized in the true-false and opposites test.

Preceding the test proper are two pages of directions in which each type of problem is explained by use of examples. Instructions are uniformly given to "work rapidly." The instructions read, "If you are not sure about something, guess at it and go on to the next thing. There are "no catch questions." You will be allowed fifteen minutes. You probably will not be able to finish in the time allowed, but do as much as possible." Then in a line to itself, "Do not skip about. Items skipped will be counted wrong." Four minutes are allowed for the reading of directions, fifteen minutes for the test proper.

This test is not comparable to the Thorndike intelligence examination for several reasons. First of all, the Thorndike test was made especially for high school graduates, particularly for those desirous of entering college, a selected group, whereas Test VI was designed for adults of varying ages and interests. In the Thorndike test, especially in those parts used by Dr. Brown, the subject is encouraged to omit. "If you do not know, go on to the next," whereas in Test VI the subject is told to guess and not to skip. "If you are not sure about something, guess at it and go on to the next thing." "Do not skip about. Items skipped will be counted wrong."

This strong command to guess and not to skip, which is given in the directions for Test VI, led us to wonder why there were so many omissions. Mere misunderstanding of the directions would not account for all of the omissions. It seemed more likely that the omissions were controlled by some selective processes which were stronger than the urge to obey the instructions. To find these selective factors becomes the problem of this paper.

SUBJECTS

In the endeavor to determine the reasons underlying omissions on Test VI, we have studied eight groups of persons who had taken the test. These groups differed in age, in educational

status, and in vocational and occupational interests, as well as in final scores obtained on the intelligence examination. Our purpose, in analyzing the intelligence test records of these eight groups, was to see if the six types of tests, arithmetic problems, opposites, analogies, true-false, information, and number series, were of approximately the same relative difficulty for each of the eight groups. The results of this study, which are given in detail in a previous paper,[4] show that there are group differences in the relative difficulty of the several types of questions.

In the present study, we have limited ourselves to two groups of persons included in the previous investigation. These two groups are alike in that (1) the members of each group were graduate students at the time that the test was given; (2) they made about the same final scores on Test VI; and (3) they found the several types of tests comprising the total examination of about the same relative difficulty. These two groups, designated as Groups I and II,[5] were as follows:

Group I consisted of 14 graduate students at the University of Pittsburgh, registered in the Research Bureau for Retail Training.

Group II contained 25 members of a course in mental measurements at the University of Michigan Summer School. The majority of these students were either college or normal school graduates. The two groups differed in vocational interests in that the members of Group I were preparing to become executives in the personnel departments of department stores, whereas the majority of the members of Group II were interested in teaching or administrative positions in public education.

Table 1 gives the average final scores of the two groups and the average number of the last example attempted, together with the standard deviations of the distribution of scores.

[4] Manson, Grace E., Group Differences in Intelligence Tests: The Relative Difficulty of the Types of Questions, The Journal of Applied Psychology, June, 1925, Vol. 9, No. 2, pp. 156–175.

[5] Group II is the same as Group VII in the previous paper.

METHOD

Having obtained two groups which, on the surface, seemed so much alike, especially in respect to the difficulty of the intellectual stimulus, Test VI, we then attempted, by further analysis, to find means of differentiating between the two groups and between members of each group in respect to one personality difference, namely, "caution." The method of doing this was to compare (1) the ratios of the total number of errors to the total number of omissions; (2) the percentages of omissions and the number of persons omitting on each type of question; (3) the percentage of errors and the number of persons making errors on each type of question.

By this technique we found how groups and members of groups differed in making a choice between omitting difficult

TABLE 1

Average final scores and average number of last example attempted

	GROUP I	GROUP II
Final scores	124.2 σ21	121.8 σ19
Number of last example attempted	140.5 σ19	137.8 σ20

questions or attempting to answer difficult questions, even if it were evident the answer was likely to be wrong. In other words, we had a measure of the readiness to guess.

The results of this statistical analysis were compared with the introspective reports of the subjects as to why they made each omission.

A scoring method was then devised which aimed to measure certain motor activities which may be described as cautious behavior. The introspective reports were of great value in pointing out the several motives for this cautious behavior as well as in giving insight into the particular stimulus or stimuli which led to cautious behavior in particular subjects. The comparison between the objective records of speed, errors, and omissions and the introspective reports also gives interesting personality clues.

RELATION OF TOTAL ERRORS TO TOTAL OMISSIONS

Table 2 gives the average number of errors and the average number of omissions made by each group.

The sum of errors and omissions is practically the same for the two groups but Group I has a tendency to omit rather than to make errors. The graduate students preparing for business

TABLE 2

Average number of errors and omissions

	GROUP I	GROUP II
Omissions	3.8	2.2
Errors	12.5	14.0
Sum of errors and omissions	16.3	16.2

TABLE 3

Average percentage of omissions and number of persons omitting

TYPE OF PROBLEM	GROUP I			GROUP II		
	Per cent of omissions	Number of persons omitting	Per cent omitting	Per cent of omissions	Number of persons omitting	Per cent omitting
Arithmetic	0.09	8	0.57	0.019	5	0.20
Opposites	0.005	2	0.14	0.01	2	0.08
Analogies	0.0025	1	0.07	0.000	0	0.00
True-false	0.000	0	0.00	0.000	0	0.00
Information	0.052	7	0.50	0.04	7	0.28
Number series	0.038	4	0.29	0.24	8	0.32
Number of persons in group		14			25	

careers were more ready to discount the directions "not to omit" than were the public school group.

RELATION OF OMISSIONS TO THE TYPE OF PROBLEM

Table 3 gives the average percentage of omissions on each type of question and the number of persons omitting. This percentage was obtained by dividing the total number of

examples of each type of question covered by each subject, into the total number of questions of that type omitted.

Examination of table 3 shows that (1) members of Group I omitted more often than members of Group II; (2) true-false, analogies and opposites were very seldom omitted by either group; and (3) that information items, arithmetic, and number series were more frequently omitted by both groups.

RELATION OF FORM OF THE ANSWER TO NUMBER OF OMISSIONS

What are the reasons for these differences? Is the form of the answer the controlling factor? Are omissions less prevalent in questions where the guessing possibilities are greatest? For example, in opposites and true-false items, the chances of guessing correctly are even. The choice is between scoring one of two words, as:

cautious—heedless.	same	opposite
Earth is mined coal the from.	True	false

In the information items and analogies there is a choice of the correct answer from among four possibilities as:

Calcutta is a city in	Egypt	China	India	Japan
feather : float :: rock :	ages	hill	sink	break

The number series and arithmetic questions do not offer any choice between answers. There is no visible clue to the correct answer. There is only a blank space in which the subject is directed to write an answer, after the mental operations are completed.

If the form of answer were the controlling factor, we should expect the order of omissions to be (1) opposites and true-false, (2) information and analogies, and (3) arithmetic and number series. This order holds except for information items and analogies. Information items are omitted more often than number series, and analogies are not omitted any more frequently than opposites or true-false items.

RELATION OF ERRORS TO THE TYPE OF PROBLEM

If the form of the answer is not the only reason for omissions, what might be another one? Is the difficulty of the question an important cause? Are there many errors on types of questions where there is a number of omissions? Table 4 gives the percentages of error and the number of persons making errors on each type of question.

Information items are the most difficult items for both groups, as is shown by the high percentage of errors and the large number of persons making errors. Opposites and arithmetic

TABLE 4

Average percentage of errors on each type of question and number of persons making errors

TYPE OF PROBLEM	GROUP I			GROUP II		
	Per cent of errors	Number of persons making errors	Per cent of persons making errors	Per cent of errors	Number of persons making errors	Per cent of persons making errors
Arithmetic	0.09	11	0.79	0.16	19	0.76
Opposites	0.10	8	0.57	0.10	13	0.52
Analogies	0.04	8	0.57	0.03	15	0.60
True-false	0.068	7	0.50	0.054	11	0.44
Information	0.16	14	1.00	0.16	24	0.96
Number series	0.07	10	0.71	0.13	21	0.84
Number of persons in group		14			25	

problems are the next hardest for Group I, if percentage of errors is taken as a standard; arithmetic and number series, if the number of persons making errors is used as the standard. Arithmetic and number series are the next most difficult items for Group II.

RELATION OF ERRORS TO OMISSIONS ON THE SEVERAL TYPES OF TESTS

When we compare errors with omissions, we find that errors and omissions are apt to be concentrated on the same type of

problems. For example, in each group errors and omissions are few for analogies and true-false statements, whereas both errors and omissions are more numerous in information items and number series.

But Group I is more apt to omit problems that appear difficult or time-consuming than Group II. This is shown particularly in the case of arithmetic problems.

If we consider the sum of the errors and omissions, as a measure of difficulty, each group has an 18 per cent deduction from the number of arithmetic problems covered. But Group I reacted by omitting half of the tedious problems, whereas Group II only omitted 2 per cent and made errors on 16 per cent. Looked at from the point of view of individual subjects, 8, or 57 per cent of the 14 subjects in Group I, omitted one or more arithmetic problems, whereas only 5, or 20 per cent of the 25 members of Group II, omitted any arithmetic examples. The same tendency in Group I, to omit rather than to make errors, is also seen in the case of information items and number series. Fifty per cent of the members of Group I omitted one or more information items. Twenty-eight per cent of Group II omitted one or more information items. Number series are apparently harder for Group II than for Group I. The sum of errors and omissions is 15.4 per cent for Group II, 10.8 per cent for Group I. Yet, Group I has a slightly higher percentage of omissions than Group II. The percentage of persons omitting is about the same, 30 per cent for Group I, 32 per cent for Group II. These comparisons are shown in table 5.

A further evidence of the relative difficulty of the questions is shown in table 6 which gives the number of persons in each group making neither errors nor omissions on each type of question.

Here again, opposites, analogies, and true-false appear easier than arithmetic, information and number series. Therefore we conclude, in answer to our previous question regarding the relation between errors and omissions, that the difficulty of the question, as well as the form of the question, controls the number of omissions.

SUMMARY OF STATISTICAL FINDINGS

Examination of the statistical results shows that: (1) few omissions are made on true-false items because the form of the answer is favorable to guessing, and the material of which the

TABLE 5

Percentages of omissions and errors and number of persons omitting and making errors

TYPE OF PROBLEM	GROUP I				GROUP II			
	Per cent omissions	Number omitting	Per cent errors	Number making errors	Per cent omissions	Number omitting	Per cent errors	Number making errors
Arithmetic	0.09	8	0.09	11	0.019	5	0.16	19
Opposites	0.005	2	0.10	8	0.01	2	0.10	13
Analogies	0.0025	1	0.04	8	0.000	0	0.03	15
True-false	0.000	0	0.068	7	0.000	0	0.054	11
Information	0.052	7	0.16	14	0.04	7	0.16	24
Number series	0.038	4	0.07	10	0.024	8	0.13	21
Number of persons in group		14		14		25		25

TABLE 6

Number of persons making neither errors nor omissions

TYPE OF PROBLEM	GROUP I	GROUP II
Arithmetic	1	4
Opposites	4	11
Analogies	6	10
True-false	7	14
Information	0	1
Number series	3	2
Number in group	14	25

test is made is not difficult for these groups; (2) few omissions are made on analogies because the material is not difficult, even though the form of the questions is not as favorable to guessing

as the true-false items; (3) a slightly higher percentage of omissions is found on opposites because the content is more difficult, even though the form of the answer is favorable to guessing; (4) information items are frequently omitted because the material is not as well known. The form of the answer, although moderately favorable for guessing, does not completely counteract the tendency to omit difficult items; (5) number series are not as frequently omitted as information items, although the form of the answer makes correct guessing improbable; percentages of error on number series are not as high as on information items; and (6) arithmetic questions are more frequently omitted by Group I than any other type of question; arithmetic questions are difficult for Group I but they do not make as high a percentage of error on arithmetic problems as on opposites.

Evidently Group I has been influenced by the form of the question and preferred to omit the problems rather than attempt to work them, since the form of the answer makes correct guessing practically impossible. Group II has not omitted but has worked the arithmetic problems, making a large percentage of errors. It is interesting, here, to notice that the sum of percentages of errors and omissions on arithmetic problems in Group I is 18 per cent, in Group II, 17.9 per cent.

INTROSPECTIVE REASONS FOR OMISSIONS

But why do persons omit when the directions tell them not to omit and urge them to guess? What reasons do the persons omitting give? Will these reasons tally with the above evidence gained from the statistical findings?

In order to see if subjects who omitted did so intentionally and for the same reasons that the statistical results seemed to indicate, the writer asked the members of Groups I and II to tell why they left out the particular problems which they did. The verbatim replies follow.

GROUP I

Reasons for omissions

Subject 1. Omitted three arithmetic problems.

"I first tried the problem by algebra—then arithmetic and thereby became so confused that I knew neither."

"From past experience I knew that in a test of this sort, arithmetic is not weighted when scored and that it takes a greater amount of time than another type of problem giving equal credit."

"I did not guess because in such arithmetical problems one does not guess readily."

Subject 2. Omitted two arithmetic problems, two information items, two opposites and one number series.

(Arithmetic)

"I skipped numbers 127 and 130 to save time."

(Information)

"I skipped numbers 42 and 122 because I was not sure of the correct answer."

(Opposites)

"I skipped 153 because I was not sure of the correct answer, and 121 I overlooked."

(Number series)

"I skipped 156 to save time."

Subject 3. Omitted one information item.

"I skipped 153 because I was unfamiliar with the second word and my eye had caught the next question. My impulse was to guess on it but time was called before the impulse could reach my paper."

Subject 4. Omitted one arithmetic, and six information items.

(Information)

"I think in general I omitted questions on general information. Some of these I had never heard of—and it seemed to me better to omit than to make a wild guess which would probably be far from hitting the point."

(Arithmetic)

"I omitted the arithmetic question because I am so dreadfully slow in doing arithmetic."

Subject 5. Omitted one arithmetic and two information items.

"None omitted. Reason—Attempted to follow specific directions to that effect."

Subject 6. Omitted three arithmetic and two information items.

(Information)

"Skipped numbers 11 and 26 because I positively did not know the answer."

(Arithmetic)

"Skipped numbers 111, 127 and 130. Started No. 111, decided the arithmetic probably wasn't weighted in scoring and as they took much more time than the rest, it would be best to skip them. Worked 145 because it was apparent at a glance."

Subject 7. Omitted none.

"Did not skip any because it was counted as an error. Guessed with the possibility that I might get it right. Interested in the problems and did not desire to skip those. Like to work with figures."

Subject 8. Omitted none. No reasons given.

Subject 9. Omitted none.

"I didn't skip any of the questions. First, the directions definitely said not skip. Second, in problems after taking time to read them, it would seem wasted if I didn't complete the operations. It seems to me the time is balanced there. "Third, on questions of knowledge if I don't know instantly, I guess."

Subject 10. Omitted none.

"When these tests were given at the (another) University we were told not to dare to omit any. I had never scored a test, but now I think I would leave out what I didn't know and go on and make time. Almost all my guesses were wrong on this test."

Subject 11. Omitted three information items.

"I skipped because I was sure I didn't know."

Subject 12. Omitted one arithmetic, two information and one number series.

(Information)

"I had nothing to go on in guessing the answer. Where I guessed in other questions I had some idea to direct me."

(Number series and arithmetic.)

"I worked at it and couldn't get it at first and expected to come back and try the problem again after I had done other questions in order to forget my various attempts."

Subject 13. Omitted five information, one arithmetic and one number series.

"I skipped a couple of the problems because I get confused when I cannot get it immediately and cannot get over it in going onto the next question.Therefore, I would rather omit one and answer more of those that I can. I waste time thinking over those I do not know and probably won't get them right in the end anyway."

Subject 14. Omitted eight arithmetic problems, five information items.

"Knowing that score depended on number correct or amount of ground covered I purposely omitted those involving arithmetic calculation intending to go back if time permitted. I was out for

speed and did not know it was the purpose of the test to have us complete each problem before proceeding to the next."

The reasons given show the effects of a certain familiarity with test taking and scoring. However, since all members of this group were in the same course in mental measurement, the information was a common factor. The two outstanding reasons for omitting are: (1) to save time; and (2) to avoid committing one's self by putting down answers which are known to be wrong. The arithmetic problems were usually omitted to save time.

It will be recalled that Group II made a smaller percentage of omissions, particularly on arithmetic items. What reasons did they give for omissions?

GROUP II

Reasons for omissions

Subject 1. Omitted eight information items.
"Not knowing I simply did not bother to guess. I do not like to guess."
Subject 2. Omitted three information items.
"I did not know the ones I omitted."
Subject 3. Omitted one number series.
"Overlooked. I probably got in too big a rush."
Subject 4. Omitted none.
Subject 5. Omitted none.
Subject 6. Omitted none.
Subject 7. Omitted none.
Subject 8. Omitted none.
Subject 9. Omitted twenty. No reason given. (absent)
Subject 10. Omitted one. No reason given. (absent)
Sub ect 11. Omitted one number series.
"I didn't knowingly omit any. I don't know why I omitted number nine."
Subject 12. Omitted none.
Subject 13. Omitted one number series.
"Worked at such a nervous tension under the time limit instructions that I felt I'd get along better if I didn't take time to think."
Subject 14. Omitted one information.
"Evidently overlooked. Haste probably caused skip, careless."
Subject 15. Omitted none.

Subject 16. Omitted one number series.
"I thought it would take too much time to figure it out, so I thought I would rather omit it than have it wrong."
Subject 17. Four omissions, three information, one number series.
"Number five evidently overlooked. Since the others were going to be counted wrong, I preferred to have it known that I knew that I did not know."
Subject 18. Omitted none.
"I didn't disobey instructions."
Subject 19. Omitted two number series, one arithmetic.
"Discovered on Army Alpha that I couldn't solve mathematical series of difficulty, so I quit wasting time on them in Test VI as soon as they reached a certain difficulty."
Subject 20. Omitted none.
Subject 21. Omitted one information, one arithmetic.
"The information I omitted because I overlooked it. In the other one (arithmetic) I thought that I could do better by going ahead than stopping to work this problem. I did not want to put down what I knew to be an incorrect answer.
Subject 22. Omitted three, one number series, two analogies.
"No. 105 (number series) didn't know, No. 108 (analogy) stage fright, No. 110 (analogy) hurried."
Subject 23. Omitted one arithmetic.
"I didn't know the answer at a glance."
Subject 24. Omitted two arithmetic, one number series, one information.
"I was careless in writing answers. Then I was careless in following orders."
Subject 25. Omitted none.
"I obeyed instructions."

In comparison with Group I, the reader will notice that the emphasis is upon following instructions. There is little deliberate skipping in order to gain time. The chief reasons for omissions are "overlooked" or "did not know and therefore did not care to commit myself." Since the majority of the items overlooked were either information or number series, items which were difficult for the group as shown by the errors, it seems likely that some of the "overlooking" was not due to chance alone.

We have given in tables 7 and 8 the detailed record of each of the members of Groups I and II. A comparison between the

TABLE 7

Group I

SUBJECT	FINAL SCORE	NUMBER OF LAST ATTEMPTED	ARITHMETIC			OPPOSITES			ANALOGIES			TRUE—FALSE			INFORMATION			NUMBER SERIES			TOTAL OMITS	TOTAL ERRORS
			1*	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		
1	146	160	17	3	1	35			34			21			35		9	18		1	3	11
2	147	162	17	2		36	1		35	1	3	21			35	2	4	18	1	1	7	8
3	150	154	17		2	34	1		34			20			33		1	16			1	3
4	99	110	12	1	1	24			24		1	14			24	6	1	12		1	7	4
5	99	126	13	1	3	28		2	27		3	17		1	27	2	8	14		4	3	21
6	129	147	16	3	2	32		2	32			19		1	32	2	5	16			5	10
7	116	139	15		4	31		1	30		3	18		1	30		10	15		2		21
8	117	130	15		1	28		3	28			17		1	28		3	14		1		9
9	144	151	17		2	33			33		1	20			32		3	16		1		7
10	107	127	14		2	28		2	27		3	17		1	27		7	14		2		17
11	96	118	13			26		4	26			15		2	26	3	7	12			3	13
12	123	129	14	1		28			28			17			28	2	2	14	1		4	2
13	113	137	15	1	1	30		5	18		1	18		1	30	5	3	14	1	1	7	12
14	153	177	19	8	1	39		1	38		1	23			39		5	19	5	2	13	10
Total.....	1,739	1,967	214	20	20	432	2	20	414	1	16	257		8	426	22	68	212	8	16	53	148
Average per person.....	124.2	140.5	15.3			30.9			29.6			16.9			30.4			15.1			3.8	10.6

* 1, number covered; 2, number omitted; 3, number wrong.

TABLE 8

Group II

SUBJECT	FINAL SCORE	NUMBER OF LAST ATTEMPTED	ARITHMETIC			OPPOSITES			ANALOGIES			TRUE—FALSE			INFORMATION			NUMBER SERIES			TOTAL OMITS	TOTAL ERRORS
			1*	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		
1	85	101	11			22		1	22			13			22	8	2	11		4	8	7
2	111	118	13		2	26			26			15			26	3	2	12			3	4
3	109	126	13		3	28			27		2	17		1	27		7	14	1	2	1	15
4	113	147	16		11	32		3	32		1	19			32		7	16		9		31
5	164	177	19		2	39		1	38		1	23		1	39		5	19		1		11
6	137	146	16		3	32			31			19			32		4	16		2		9
7	132	150	17		2	33		1	33		4	19		1	32		7	16		1		16
8	107	111	13		2	24			24			14			24		1	12		1		4
9	105	139	15		1	31	7	3	30		1	18		1	30	13	4	15			20	10
10	104	118	13		3	26	1		26		1	15		1	26		5	12		2	1	12
11	138	148	17		5	32			32			19			32		2	16	1	2	1	9
12	133	155	17		3	34		3	34		3	20			34		6	16		4		19
13	139	150	17		1	33		1	33		1	19			32		6	16	1		1	9
14	115	120	13			26			26			16			26	1	2	13		2	1	4
15	108	110	12		1	24			24			14			24			12		1		2
16	119	148	17		3	32		6	32			19		1	32		11	16	1	1	1	22
17	134	145	16		2	32			31		1	19		1	31	3	2	16	1		4	6
18	100	106	11			24			22			14			23		4	12		2		6
19	154	164	18	1		36			35		1	21		1	36		3	18	2	1	3	6
20	158	176	19		6	39			38		1	23			38		10	19		1		18

21	133	165	18	1	3	36		6	36		3	21			36	1	10	18		3	2	25
22	101	124	13	2	3	27		5	26		1	17			27		1	14	1	5	3	15
23	128	144	15	1		32		1	30			19		2	31		9	16		2	1	14
24	105	134	15	2	4	29		5	29		2	18		1	29	1	4	14	1	3	4	19
25	113	123	13			27		1	26		1	17		1	27		4	13		1		8
Total	3,045	3,445	377	7	60	756	8	37	743		24	448		12	748	30	118	372	9	50	54	301
Average per person	121.8	137.8	15.1			30.2			28.3			17.9			29.9			14.9			2.2	12.0

* 1, Number covered; 2, number omitted; 3, number wrong.

reasons for omitting and the speed and accuracy scores of the subjects is, in many cases, illuminating.

THE MEASUREMENT OF "CAUTION"

Having established, through analysis, the fact that omissions were controlled (1) by the difficulty of the material, (2) by the form of the answer, and (3) by the attitude toward the directions, our next matter of interest was to see if this third factor, "attitude," could be measured.

Brown,[6] in his thesis, has attempted to measure a similar factor present in intelligence test performance. He has called his factor "caution." He has defined "caution" as a trait of human personality, as opposed to "rashness." A cautious person is one of the "careful," "conservative," type, while one who tends to be the opposite extreme is commonly called "rash" or "careless." The number of wrong answers made on the intelligence examination, were taken as indicative of the presence or absence of the "caution" factor. The greater the number of errors, the less "cautious" was the subject. (It should be recalled that his instructions did not forbid skipping.)

In discussing the situations in which caution is likely to be operative, Brown answers the following question. "Under what circumstances, does this factor (caution) if present in an individual, make its appearance?" His answer is:

> No well-defined situation may be described in answer to this question and regarded as a typical one. Generally speaking, lack of knowledge, either of facts or methods of procedure, coupled with other elements which make the situation an important one, such as the necessity for speed, the urgency of the occasion, and the character of the probable outcome, furnish a sufficient stimulus for the activity of the caution factor.

Thus, if the elements of the situation demand, in their handling, operations which are so simple for the subject that the content and technique, the speed, the urgency and "probable

[6] Brown, Wm. M., Character Traits as Factors in Intelligence Test Performance, Archives of Psychology, May, 1923, No. 6.

outcome" factors have the minimum of force, then the "caution" measure is vitiated, simply because the material for stimulating it is lacking. This is one variable which has to be controlled in measuring "caution" on an intelligence test. In an earlier paper[7] we have shown that different types of questions are of unequal difficulty for the same and for different groups. For example, arithmetic problems are more difficult for academic groups than analogies, and analogies are more difficult for policemen than arithmetic problems. Yet, both arithmetic problems and analogies are harder for policemen than for academic groups. Therefore, caution comparisons should be made only between similar groups—groups where the strength of the stimulus is comparable. Otherwise we are measuring mental acuity rather than caution.

At the other extreme is the situation where the examples are so easy that few errors or omissions are found. Thus, 10 out of 25 subjects in Group II, made neither errors nor omissions on analogies. In the cases of these ten people, we do not know whether caution showed its influence in slowing up the answering process, or whether the questions were so simple and the answer so evident that caution had but little chance to operate. This is certainly a different "caution" setting than in the case of policemen, where 81 out of 81 persons made errors or omissions on analogies, and where the average percentage of errors was 35 per cent and of omissions, 28 per cent.

This is why we have limited our present study to Groups I and II where the final score, the speed, and the relative difficulty of the six types of questions are about the same.

Perhaps it is fitting at this time, to discuss in detail what we have meant by the terms "caution" and "cautious." In general, we have adhered to a behavioristic point of view and have considered persons cautious if their reactions in situations capable of stimulating caution, have been such as would be described as wary, heedful, and hesitant. But, in addition, we have taken cognizance, particularly in the introspective

[7] Manson, Grace E., Group Differences in Intelligence Tests: The Relative Difficulty of the Types of Questions.

reports, of the central processes, which took place in the interval when the subject was making a choice between stimuli to react to and was determining the form of the reaction. Thus, we have been interested in discovering group differences in the manifestations of activities which would be described as cautious or rash, as well as the psychical processes which led individuals to make these particular motor reactions.

Webster's Collegiate Dictionary describes a cautious person as one who is "attentive to examine probable consequences of acts so to avoid danger." Now persons taking Test VI were placed in a setting, where it was necessary for them to become attentive to what consequences of their acts they considered the least dangerous. This conflict became acute on those questions where the correct answer was not immediately known.

In the main, subjects were attentive to the following three classes of stimuli, making those responses which had for them the least dangerous consequences.

1. Some subjects were attentive to the *instructions* not to omit and made errors knowingly, because they were instructed to guess.

2. Some subjects were attentive to the fact that *time* was passing and that it was desirable to answer as many questions as possible. These subjects omitted questions that were difficult and time consuming and guessed at others in order to cover as much ground as possible.

3. Some subjects were particularly attentive to the need for putting down only *correct* answers. They considered wrong answers as particularly undesirable and therefore worked slowly and checked answers, which repetition would lessen the number of examples covered. Difficult questions were frequently omitted in order that the subject might not injure his intellectual reputation for accuracy.

Which of these three types of persons shall we call cautious? We cannot see that there is any particular advantage in so delimiting the definition of the term cautious to exclude one type of reaction or the other. However, we do consider it of great importance to ascertain what mode of behavior, in

relation to "caution," a subject is likely to choose when placed in a situation where a choice is possible; also to see if groups composed of persons with the same mental acuity but different occupational interests will make different choices.

In the earlier part of this report, we have shown that the members of Group I were more likely to omit on arithmetic questions than on other types of questions and that these omissions were made in order to gain time; whereas members of Group II were more likely to follow instructions, making errors rather than to omit.

But in both groups there were persons who did not conform to the general tendencies of the group. From the practical point of view of selection, these are the persons whom we should like to have differentiated immediately. It would be highly desirable if these persons could be distinguished by some objective scoring of their mental test records. This is a difficult task and we do not think that we have measured the trait "caution" with a high degree of reliability. Yet, we have attempted to do this, using the following method.

We have limited the measuring process to Group II because from both the introspections and the statistical analysis, it seemed as if the "caution of intellectual reputation" (desire not to commit one's self) and "caution of directions" (did not omit because told not to), were the more predominating ones in this group.

To obtain a criterion for such a scoring method, we asked the members of Group II to rate themselves on Bureau of Personnel Research Graphic Rating Scale, Form R-1. It was unfortunate that we had to use self-ratings as they are undoubtedly of low reliability, but members of the class were not well enough acquainted to make ratings of one another. Therefore, the correlations reported must be interpreted with the conditions of obtaining the criterion in mind. The steps on the graphic rating scale for caution were as follows:

Always acts on the spur of the moment	Impulsive. Always makes prompt decision	Shows moderate deliberation	Cautious, deliberate and considerate	Extremely wary and hesitant. Acts only after careful consideration

Scores were obtained by measuring the distance from the left hand end of the line to the point where the subject put his check. High numbers indicate a great deal of caution, low numbers, rashness.

Table 9 shows the correlation coefficients between the various caution indices and the caution self-ratings.

When these variables are combined in multiple correlation, the multiple correlation coefficient is raised to 0.42 ± 0.08. Although the zero order correlations are low, the directions which they take are interesting. Errors correlate negatively with self-ratings on caution: the more errors the less cautious. Omissions correlate positively with caution, speed correlates negatively with caution. Errors and omissions have a low negative intercorrelation. Speed and errors have a positive cor-

TABLE 9

		1	2	3	4
1	Caution rating				
2	Per cent of errors	−0.32			
3	Per cent of omissions	+0.25	+0.05		
4	Speed (number of last example attempted)	−0.22	+0.37	−0.22	

relation. Speed and omissions have a low negative correlation. This latter intercorrelation is probably affected by two types of caution, the urge to skip difficult problems which would correlate positively with speed, and the urge not to put down incorrect answers even after consuming time in working them, which would lessen speed and result in a negative correlation. The latter tendency, in this case, seems to be the stronger one.

In order to put the measure of cautiousness into one number, we have formulated what we have called the "rashness" index, or index of "lack of caution." Since errors correlated negatively with caution ratings and omissions correlated positively, the ratio between these two gives a measure of "rashness" and "caution." The ratio form also better equates the difficulty of the material since the "rashness" index is the same for a

person who has eight errors and two omissions as for one who has four errors and one omission.

Since the problems were probably more difficult for the former person than for the latter, this procedure corrects for difficulty, assuming that if the situation were of equal difficulty for each, the degree of caution would be the same. There is a certain fallacy in this hypothesis, in that caution may not increase with difficulty of the situation in the ratio that we are assuming. In other words, we do not know the regression lines for either difficulty of situation upon caution or caution upon difficulty of the situation. However, since we are measuring caution rather than intellectual acumen, it seems necessary to consider the caution variable when the caution stimuli are of equal strength.

In the "lack of caution" index, per cent of errors has been taken as the numerator and per cent of omissions as the denominator. The larger the index, the greater "rashness" or the less "caution."

This index correlated -0.32 with caution rating. If speed is added to the equation, the multiple correlation coefficient becomes 0.35. This is not quite as high as the multiple correlation using omissions, errors and speed as separate items.

Correlations were also found between self-ratings on other traits and "lack of caution" index.

"Lack of caution" index

Self-ratings on orderly	$r = 0.08$
Self-ratings on submissive	$r = -0.01$
Self-ratings on heedless	$r = -0.10$
Self-ratings on wilful	$r = 0.34$

Ratings on wilfulness correlated positively with "rashness" index. The other coefficients are too low to have any significance.

All of these measures taken from Test VI are complicated by the fact that some students were cautious of directions and wrote down wrong answers knowingly, simply because they felt forced to do so.

SUMMARY

We have studied objective records and introspective reports of two groups of persons making equivalent final scores on an intelligence test. By an examination of number of examples attempted, number of errors, number of omissions, and types of question having the greatest number of errors and omissions, we have found that omissions are controlled by form of question and answer, by difficulty of question, and by the reactions of the subject toward the urge to speed up, to disregard the directions not to omit, and to put down only correct answers. Verbal reports supplement and aid in interpretation of objective responses.

Groups I and II differ in respect to what may be called choice of "caution" stimuli. For caution may be exhibited by reacting to certain elements in the total test situation, with responses that make reactions to other "caution" stimuli impossible. For example, cautiousness of directions makes omissions impossible and incorrect answers probable. Cautiousness of accuracy, desire to have only correct answers, leads to omissions or few examples answered. Cautiousness of time, desire to finish the test, means likelihood of omitting or making errors on difficult and time-consuming problems. The choice between caution stimuli has to be made by the subject and the responses made are, as such, an expression of his personality.

On this basis, our results show that Group I subjects were more apt to respond to the speed factor than members of Group II, especially in those cases where the form of the question made guessing impossible. However, some subjects in Group I responded more actively to the request not to follow directions. Perhaps this tendency not to follow directions, when the subject foresees that more favorable results may be gained by omitting, could be called initiative, and the tendency not to follow directions and to omit, when the subject fears to put down the incorrect answer, lack of initiative or timidity.

As groups, we may then say that this factor of initiative was

more often present in Group I, the business group, than in Group II.

An effort was made to measure the several caution reactions found in Group II. Self-ratings on "caution" were taken as the criterion. Per cent of omissions correlated 0.25 with caution, speed -0.22 with omissions, thus showing that the subjects making numerous omissions were inclined to judge themselves as cautious, and they were also inclined to be slow. On the other hand, persons who made errors were inclined to judge themselves as not so cautious, (correlation between percentage of errors and caution -0.32). The persons making errors also were more inclined to speed, the correlation between speed and errors $+0.37$. When a combination of the three items, speed, omissions, and errors, is made by multiple correlation, the coefficient of correlation increases to 0.42 ± 0.08.

The regression equation here given is probably of little value for other groups, due to the questionable reliability of the criterion as well as the internal consistency of Group II. Groups prone to omit for speed would require a different weighting. However, a detailed examination of errors and omissions on Test VI, supplemented by introspective reports of the subjects in respect to reasons for omission, will give insight into their personalities which is not ascertained through total scores alone.

PERSONALITY TESTS: WHITE AND NEGRO ADOLESCENTS[1]

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The investigation here reported has been directed toward three questions: (1) Is there need of specific norms for adolescents, because these immature boys and girls give different forms of reactions from those given by adults to personality tests? (2) How do the results of such tests as the Pressey X-O tests, the Carnegie test IX (the Ream adaptation of the Downey Will-Temperament Scale), and the Woodworth-Mathews questionnaire agree when they are applied to adolescents? (3) What do such tests indicate as to similarity or diversity between white and negro boys and girls?

The Pressey X-O Scales[2] for measuring emotions were used with both children and adults. Form A designed for adults, consists of four tests attempting an inventory of what the individual finds are for him, (I) unpleasant associations, (II) common associations, (III) wrong acts, (IV) causes of worry and anxiety. Form B, adapted to children, is devised to ascertain what they feel to be (I) wrong, (II) causes of worry and anxiety, (III) interesting. As the individual tested must mark all the words that affect him unpleasantly or as wrong or interesting, and also circle the most unpleasant, worrisome, or interesting of the five words in each line, it may be possible to ascertain both the spread of emotionality and the preponderant emotional trends in regard to several hundred affective situations.

[1] This study was aided by a grant from the Commonwealth Fund.

[2] Pressey S. L., A Group Scale for Measuring Emotions, Jour. Abnormal Psychol., XVI, pp. 55–64.

Results from Form A have been obtained from 157 college students and 80 summer school students, all women. The latter group is somewhat less advanced scholastically but more mature than the former. The two groups have been kept distinct as they show some marked contrasts in responses to the tests. In test I the 125 words have been selected, as being associated with (*a*) sex, (*b*) disgust, (*c*) fear, or (*d*) suspicion. Some of the words in the first group seemed to have no sex-connotation for the students, as was ascertained indirectly through various association experiments after the tests had been taken. In a few cases the jokers may have distinctly unpleasant associations, as for example the word "fried." Bearing these reservations in mind, we find that the group of teachers circled about an equal proportion (27 per cent) of the words listed as "sex," "disgust," and "suspicion," and put the remaining 19 per cent in the "fear" list. Over 41 per cent of the words encircled by the student group were in the "disgust" list; 24, 18, and 16 per cent were circled respectively in the "sex," "fear," and "suspicion" lists.

The disagreement of the two groups as to particular words encircled is striking. Nearly every word in the "disgust" list seemed more unpleasant to a greater number of students than of teachers, and such terms as pervert, meanness, immoral, giggle, seemed much more offensive to the teachers than to the students. The norm was the modal word in every line except the thirteenth, where meanness proved equally as unpleasant as suck (the norm) because the teachers found the former most unpleasant, as opposed to the majority of the students.

In test II the modal words correspond to Pressey's norms with four exceptions as shown below:

5. Sleep;	worry (norm)	fright (modal)
11. dream;	beautiful (norm)	floating (modal)
23. sickness;	children (norm)	worry (modal)
25. death;	water (norm)	hopeless (modal)

In each case except the last, the teachers conform to the norms, but not the students. Only two words (sew and sale)

are not circled at least once, hence individual variations are very noticeable and at times symptomatic of difficult adjustments.

Some interesting variations from the norms appear in test III. Here the college students are somewhat nearer the norms than the teachers. Both reckless and fussy are marked as worse than careless, the teachers especially emphasizing reckless; dishonest is circled three times as often as illegitimate, as is also debt as compared with chewing; stingy and meddling, are equally wrong according to the students, but meddling is three and one-half times worse in the teachers' estimations; cruel is much worse than street-walker, swindler and mistress than a dope-fiend; persecute and nagging, are about equally bad, though the students stress the latter. Three of the words are not encircled as blameworthy by anyone: dancing, tired, and church-going.

The modal words for test IV differed from the norms in 9 out of the 25 lines; in the case of 4 of these the majority of teachers encircled some other word and most of the students made other choices in another 4. "Money" was an insignificant third in degree of worries in both groups, as compared with failure and sickness. The other 8 modal words as compared with the Pressey norms were: conscience vs. clothes, falling vs. religion, cancer vs. insult, pain vs. blues, bashfulness vs. business, windstorms vs. syphilis, confusion vs. teacher, death vs. awkwardness.

If classified into the five groups suggested by Pressey, the words encircled by the student and teachers were grouped as follows:

	SUSPICIOUS	JUMPY	SELF-CONSCIOUS	MELANCHOLIC	HYPERCHONDRIACAL
	per cent	*per cent*	*per cent*	*per cent*	*per cent*
Students	15	18	18	26	24
Teachers	16	20	13	27	24

It is interesting to note that in both groups about 50 per cent of the encircled words belong in the melancholic and hyper-

chondriacal lists, and that the proportion of the self-conscious words selected is smaller for the more mature group.

As the modal words are found in different combinations in Forms A and B, it is difficult to make any reliable comparison for the two corresponding tests between children and adults. Both the women and the young girls agree in stressing the wrongness of ignorance, dirty, smutty, divorce, dishonesty (swiping), immodesty, and recklessness; but adults put greater

TABLE 1

W is used to indicate the white children and N the negro.

TEST I (WRONG)	TEST II (WORRIES)	TEST III (INTERESTS)
1. Smoking	1. Forgetting (W)	1. Vaudeville (N)
3. Ignorance	4. Accidents and failure	2. Eating (N)
4. Fussing (N)	5. Disease	5. Studying (N)
5. Talking-back	6. Fire	6. Acrobats (W), minstrels (N)
6. Slang (W)	7. Tuberculosis	8. Hymns (N)
7. Bluffing	8. Death	9. Good boys
8. Kidnapping	10. Insanity (W)	10. Card parties and pageants (W)
9. Meddling	11. Storms (W)	12. Pop
10. Slow (N)	12. Suffocating	13. Typewriting
11. Faultfinding (N)	13. Poison	14. Actors (W)
13. Butting-in	14. Giggling	15. Gallahad (W)
14. Disgrace	15. Nightmare	16. Prayer (N)
15. Grumbling	16. Smoking (W), teasing (N)	17. Drawing (W), history (N)
17. absentminded (W), sly (N)	18. Drowning (W)	19. Traveling (W)
21. Bullying	19. Gun	20. Teachers and soldiers
23. Tobacco	23. Knives	21. Poems (N)
25. Borrowing	25. Rough	22. Ferris-wheel
		23. Bankers (W)
		24. Circus (W), cities (N)
		25. Joyriding.

emphasis on meddling, snobbishness and thoughtlessness; the children on smoking, worry and toughness. As to worries, both adults and children agree in finding failure and accidents, tuberculosis, fire, death, insanity (nervousness, nervous-breakdown) and forgetfulness the most serious. Religion, self-consciousness, longings are of much less consequence to the children than to the adults.

A small number of teachers tried Form B and their modal

words agreed with Pressey's norms in all but five lines, and in three of these they agreed with the children in their belief that smoking, bullying and borrowing are worse than begging, yellowness and flunking respectively. It may be of interest to note that the majority of children believe (as against the adults and Pressey's norms) that

Ignorance	is worse than stinginess
Talking-back	is worse than extravagance or boasting
Slang	is worse than stubbornness
Kidnapping	is worse than war
Tough	is worse than cad
Butting-in	is worse than cribbing
Disgrace	is worse than immodesty
Grumbling	is worse than snobbishness
Absentmindedness	is worse than sham

Form B was given to 232 white and 282 negro children in the seventh and eighth grades. The agreement of a majority of these children with the Pressey norms for the modal words is not close, as out of 25 words in each test the modal words correspond to the norms as follows:

	I	II	III
White	12	9	11
Negro	9	13	10

The modal words for these two groups of children in the lines where they differ from the norms are shown in table 1.

As the white and negro children chose the same modal word in test I in all lines except six and in test II in all but seven, but in test III agreed only on eleven, there is evidently a greater consensus of opinion about wrongs and worries, as suggested by these tests, than about likes and interests.

It is interesting to note how evident is the effect of school training and social restriction in these choices. For example, the reason for the overwhelming vote against smoking, talking-back and slang is obvious. These children on the whole believe that fibbing and recklessness, betting and grumbling,

absentmindedness and slyness, borrowing and teasing, divorce and faultfinding are about equally wrong; and that cowardice is much worse than temper, butting-in than stupidity, a strike than a trust, bullying than yellowness, tobacco than bribery, pool, or craps. The negro children emphasize that fussing, slowness, faultfinding, slyness, temper, kidding, fighting, quarreling, and teasing are wrong much more than do the white children. Both groups find weakness, meanness, nagging, delay, blarney, spending, hazing, queerness, neglect, prizefighting, dancing, unions, trusts, pull, and speculating least wrong. The difference between the modals of the boys and of the girls is very slight; the girls stress flirting, grumbling, and quarreling a little more, and the boys meddling, fighting, betting and bragging.

In test II, the modal words are not as clearly defined as in test I (especially in lines, 10, 14, 19, 21, 22, 23, and for the negro children also 15, 16, 17, 25, where several words are circled with about equal frequency) perhaps because these words do not represent children's most pronounced worries, or are of nearly equal importance in their experience, or because worries are more subject to individual diversity than wrongs. Forgetting and school, failure and accidents, reciting and suffocating, poison and lessons, jealousy, smoking and teasing, drowning and lies, crying and family, roughness and flightiness, fire and germs, knives and disposition, seem to have nearly equal influence in causing worries. The least worrisome appear to be depression, clothes, looks, self-consciousness, moodiness, queerness, politics, and wit. Insanity and flightiness are circled more often by the white children than by the negro, religion, soul, God, unfairness, and homeliness more by the negro. The sex differences seem insignificant. It is of interest that the worry least often circled in line 3 is clothes for the girls and looks for the boys. Do such results confirm a limitation of this type of test, as suggested by other investigators, that very unreliable answers are obtained from introverted, egocentric individuals? May it not be true of these adolescents that many of them are on guard against divulging their feeling at points where they are most sensitive?

Test III shows the greatest differences between negro and white children and also between the girls and boys. The two racial groups agree better in what they are least interested in, than in their greatest likes and interests. Fortune-telling, Raphael, day-dreaming, smoking, rough boys, palmistry, onions, loafing, Mowgli, deacons, crowds, and arguing are least often circled by both groups. Both also prefer athletic to pretty girls, minstrels and acrobats to talking, good and handsome boys to leaders (except the negro boys who are more interested in leaders than in handsome boys). But the negro children prefer hymns to jazz, pageants to card parties,

TABLE 2

WHITE		NEGRO	
Boys	Girls	Boys	Girls
Boating	Vaudeville	Boating	Vaudeville
Camping	Hiking	Napoleon	Edison
Napoleon	Beethoven	Saxophone	Singing
Pretty and athletic girls	Athletic girls	Pageants	Socials
		Sports (Babies*)	Babies (Sports*)
Reading	Dancing	Businessmen and soldiers	Teachers and nurses
Bands	Singing	Circus	Cities
Aviators	Actors		
Soldiers	Teachers		
Books	Newspapers		
Machines	Ferris-wheels		
Fishing	Joyriding		

* Second choice.

musicians and artists to actors and aviators, poems to books, history to drawing, studying to dancing, and like babies and children better than do the white children. The negro boys are in better agreement with the girls as to chief interests than are the white boys and girls. Some of the more significant sex preferences are shown in table 2:

Besides special emotional trends, the Pressey X-O tests may also indicate the amount of emotionality by the total number of words underlined in each test. There are no constant differences between the seventh and eighth grades in the case of these children either in totals or deviations, perhaps because

the numbers are small. A comparison with Pressey's norms for Form A (table 3) shows that percentiles of these college students and teachers agree with the norms in tests II and III, though there is tendency on part of the students to give fewer associations in test II, and on test III the teachers tend to find more "wrongs" and the students somewhat fewer. On tests I and IV, these averages are higher than the norms, more especially in the number of unpleasant associations. The deviations from the norms correspond very closely to those given by Pressey. For Form B, the mean deviations agree very closely with those given by Pressey for high school freshmen in the case of both white and colored children. There is a slight tendency for the deviations to be higher in the case of the negro children in "wrongs" than in "worries" and "interests." The total number of associations, both medians and means, vary so widely from Pressey's norms for tests II and III, that it is peculiar that the median for test I is so close to the norm. It is significant that the negro totals for "wrongs" is so much lower than for "interests" and that the opposite is true for the white totals. As can be seen from the percentile scores (table 3) the total scores for the groups tested agree with the Pressey norms only in regard to what is felt to be wrong and blameworthy, but vary considerably from the norms in the other tests. Where comparison is possible, the results for the children and adults agree closely except that the extreme scores of the children are greater. The scores of the two adult groups agree best in regard to worries (test IV) and differ about equally for what is wrong and unpleasant (tests III and I), the students averaging lower scores in both these tests.

To investigate the dynamic side of personality, Ream's[3] adaptation of the Downey Will-Temperament tests was tried after it was found impossible to use Miss Downey's individual form on account of the time required. In spite of the dubious interpretation of some of these tests, others seem to have pro-

[3] Ream, M. J., Group Will-Temperament Tests, Jour. Educat. Psychol., XIII, 1922, pp. 7–16.

TABLE 3

Pressey X-O Tests

Form A (totals)

	NUMBER	25 PERCENTILE	MEDIAN	75 PERCENTILE	HIGHEST SCORE	25 PERCENTILE	MEDIAN	75 PERCENTILE	HIGHEST SCORE	25 PERCENTILE	MEDIAN	75 PERCENTILE	HIGHEST SCORE	25 PERCENTILE	MEDIAN	75 PERCENTILE	HIGHEST SCORE
		Test III (wrongs)				Test IV (worries)				Test I (unpleasant)				Test II			
Pressey norms		60	73	86		33	46	55		27	41	52		41	55	70	
Students	157	61	69	77	101	42	50	61	119	42	49	59	101	41	49	61	102
Teachers	80	70	77	86	101	39	50	66	94	49	60	72	85	39	54	67	91
Total	237	63	72	80		41	50	63		43	53	68		39	50	62	

Form B (totals)

		Test I (wrongs)				Test II (worries)				Test III (interests)			
Pressey norms (High School freshmen)			70				24				40		
White													
Girls	102	59	74	93	123	41	59	67	123	45	56	69	109
Boys	130	61	75	93	122	31	41	60	121	46	59	80	112
Total	232	60	74	93		36	45	65		45	57	73	
Negro													
Girls	182	52	65	82	124	38	50	70	125	56	72	89	124
Boys	110	49	66	86	120	39	49	66	121	59	79	92	125
Total	292	51	65	85		38	50	69		57	72	90	

Form A (average deviations)

		Test III	Test IV	Test I	Test II
Pressey norms		13	15	11	10
Students	157	13	16	12	10
Teachers	80	12	16	10	10
Total	237	13	16	11	10

Form B (average deviations)

		Test I	Test II	Test III	
Pressey norms		17	18	18	
White:					
Girls	102	16	17	19	
Boys	130	17	18	17	
Total	232	17	18	18	
Negro:					
Girls	182	18	17	17	
Boys	110	18	17	17	
Total	292	18	17	17	

nounced value, so that it was deemed best to use the whole series, more especially as comparative measures might give information about some of the doubtful tests. In fact, the use of Miss Downey's tests with individual college students had convinced the writer of their value in the analysis of personality.

When the scores, grouped according to the Carnegie percentiles for adults, are compared (table 4), it is seen that the differences between boys and girls are small, except in tests XI and XII for the negroes, where the divergence is more

TABLE 4

Percentiles in test IX (according to Carnegie adult norms)

	NUMBER	1	2	3	4	5	6	7	8	9	10	11	12
Negro boys	84	3.6	5.1	1.5	4.5	4.5	6.6	6.1	7.5	1.8	2.4	3.9	5.8
Negro girls	199	4.2	5.2	1.8	4.4	3.8	6.7	6.2	7.0	2.1	1.9	2.5	7.0
Total	283	4.1	5.2	1.7	4.4	4.0	6.7	6.1	7.2	2.0	2.1	2.9	6.7
White boys	59	4.9	5.9	2.4	5.4	3.0	5.2	6.4	6.0	3.1	3.1	3.1	6.2
White girls	81	5.2	5.2	2.5	4.4	3.6	5.7	6.6	5.9	2.9	2.2	2.0	6.8
Total	140	5.0	5.5	2.5	4.7	3.3	5.5	6.5	6.0	3.0	2.6	2.5	6.6
Students	156	8.2	6.1	5.8	4.7	5.2	6.2	7.3	2.6	7.1	6.5	4.5	6.8
Teachers	67	6.0	4.6	5.3	5.7	5.5	6.6	6.2	4.2	3.8	3.6	3.0	6.2
Total (adult)	236	7.6	5.7	5.7	5.0	5.3	6.4	7.0	3.1	6.1	5.6	4.1	6.7

than one percentile. As for the racial groups, the negro boys have somewhat lower averages in the first four and the last four tests, and equal or higher averages in the middle four than the white boys; between the two groups of girls, the differences are less, the negro girls having lower scores on tests I, II, and IX (speed of movement, freedom from load, coördination of impulses), and higher on tests VI and VIII (motor impulsion and freedom from self-consciousness). When the scores are combined, the negro children have lower averages on tests I, III, and IX (speed of movement, speed of objective

decision, coördination of impulses), but higher on tests VI and VIII than the white children. The year-groups are probably too small, for no constant tendencies are evident, except that of higher scores among the younger than among the older children on tests requiring speed. The averages of the adults for these same tests are higher by 3 percentiles or more in tests I, III, IX, and X, and as much lower in test VIII; and between 1 and 2 percentiles higher in tests V and XI.

In order to see whether more significant trends might appear if grouped according to Miss Downey's suggestions, the scores on tests I, II, III, and IV were combined, and VI, VII, VIII,

TABLE 5

Reaction-pettern percentiles in text IX (according to Carnegie adult norms

	NUMBER	A 1-4	5	B 6-8	C 9-12	TOTAL
White boys	59	18.4	3.0	17.6	15.6	54.6
White girls	81	17.3	3.6	18.2	14.1	53.2
Negro boys	84	15.3	4.5	20.0	13.8	53.0
Negro girls	199	15.7	3.8	19.9	13.5	52.8
White total	140	17.8	3.3	18.0	14.7	53.8
Negro total	283	15.4	4.0	20.0	13.6	53.0
Students	169	24.9	5.2	16.1	24.9	71.1
Teachers	67	21.6	5.5	17.0	16.6	60.6
Adult total	236	24.0	5.3	16.4	22.5	68.3

and IX, X, XI and XII (test V being omitted as too liable to error both in scoring and interpretation), thus forming patterns A (the mobile, rapid-fire type), B (the aggressive), and C (the deliberative type).

According to this grouping (table 5), the white boys have a slight advantage over the girls in patterns A and B, while the negro boys and girls have almost the same averages. The average total scores show no difference between these groups. The adults have decidedly higher averages for patterns A and C but lower for pattern B.

Because individual variations on the tests are so great,

another attempt at comparison was made by finding the groups in which the average of each individual tested was at or above the fiftieth percentile. The percentage of each of the groups

TABLE 6

Percentile table for adolescents

	FIRST QUARTILE	SECOND QUARTILE	THIRD QUARTILE	FOURTH QUARTILE
White children				
Speed of movement	35–48	49–54	55–62	63–84
Freedom from load	0.20–0.39	0.40–0.44	0.45–0.54	0.55–0.84
Speed of objective decision	2–14	15–17	18–22	23–36
Speed of subjective decision	1–16	17–20	21–25	26–36
Flexibility in disguise	0	1–2	3	4–6
Motor impulsion	0.63–1.69	1.70–1.85	1.86–2.09	2.10–2.99
Assurance in visual memory	0–12	13–18	19–22	23–31
Freedom from self-consciousness	0.05–0.64	0.65–0.79	0.80–1.05	1.06–5.60
Coordination of impulses	10–49	50–59	60–72	73–103
Motor inhibition	1–18	19–39	40–55	56–89
Care for detail	0–9	10–15	16–19	20–34
Perseveration	20–82	83–105	106–139	140–249
Negro children				
Speed of movement	19–43	44–50	51–60	61–120
Freedom from load	0.14–0.35	0.36–0.44	0.45–0.51	0.52–1.00
Speed of objective decision	1–9	10–13	14–17	18–36
Speed of subjective decision	2–13	14–20	21–24	25–26
Flexibility in disguise	0–1	2	3	4–6
Motor impulsion	1.20–1.82	1.83–2.01	2.02–2.25	2.26–4.25
Assurance in visual memory	0–11	12–16	17–22	23–31
Freedom from self-consciousness	0.05–0.53	0.54–0.69	0.70–0.89	0.90–3.09
Coordination of impulses	1–42	43–52	53–62	63–100
Motor inhibition	1–31	32–49	50–68	69–90
Care for detail	0–9	10–14	15–20	21–34
Perseveration	10–86	87–106	107–139	140–348

that were at or above the fiftieth percentile in the first reaction-pattern alone, only in the second and only in the third; in both first and second, both first and third, both second and

third, and above that point in all three patterns are given below. The negro children were classed as twelve to fifteen-year-olds and sixteen-year-olds, because both boys and girls were thus about evenly divided and especially because there were some peculiar differences between the younger and older children (see table 7).

The percentages of those tested whose averages were below the median in all the reaction-patterns were: students 6 per

TABLE 7

PERCENTAGES ACCORDING TO ADULT NORMS	PATTERNS						
	A	B	C	AB	AC	BC	ABC
White boys	7	42	2	16	11	7	15
Negro boys:							
12–15 years	2	53	0	22	0	11	9
16 years	5	60	0	21	0	8	5
Negro boys (total)	4	57	0	22	0	10	7
White girls	5	47	1	27	5	1	13
Negro girls:							
12–15 years	3	41	1	38	0	8	10
16 + years	2	67	1	21	1	7	2
Negro girls (total)	2	56	1	28	1	7	5
White total	6	45	2	23	8	4	14
Negro total	2	56	1	26	1	8	6
Students	2	2	2	3	19	4	67
Teachers	8	15	2	31	9	8	28
Total (adults)	3	6	2	10	17	5	56

cent; teachers 3 per cent; white boys 7 per cent; girls 5 per cent; negro boys 4 per cent; girls 6 per cent. According to the Carnegie norms for adults, the predominance of the B pattern with the children and of the ABC pattern with college students is equally conspicuous. The preminence of the AB pattern with both children and teachers may also be worthy of comment, as well as the infrequent occurrence of the AC pattern among the negro and its relative importance among

the white subjects. The two most frequently occurring patterns among the children are the B and AB, among the students ABC and AC, among the teachers AB and ABC. The least common for all groups are the A and the C patterns, though among the teachers the A pattern is found as often as the AC and BC.

When a similar grouping of reaction-patterns is calculated from the norms of the white children (as seen in table 8) there

TABLE 8

PERCENTAGES ACCORDING TO WHITE ADOLESCENT NORMS	BOYS						
	A	B	C	AB	AC	BC	ABC
White boys	10	4	8	12	23	27	18
Negro boys:							
12–15 years	25	19	11	6	14	19	6
16 + years	15	24	6	12	15	15	12
12–16 years	20	22	9	9	14	17	9
White girls:	8	8	13	12	17	16	26
Negro girls:							
12–15 years	6	11	12	12	22	16	20
16 + years	0	16	18	8	10	30	17
12–16 years	3	14	16	10	15	24	18
Boys and girls:							
White	9	6	11	12	20	20	23
Negro	8	16	14	10	15	22	16

is a conspicuous preponderance of A and B alone and combined with C in the case of negro boys; and equally significant are combinations of patterns rather than preponderance of a single pattern as regards the white boys. The negro girls show a similar lack of the A type as do the white children, and predominance of the BC-groupings, a tendency that is peculiarly evident among the older negro girls. The difference between the negro boys and the rest in percentage of the AB

patterns is also great, 25 per cent more than the negro girls and 27 per cent more than the white children. The white children and the younger negro girls average about 38 per cent for the B, C, and BC groups, the negro boys about 48 per cent, but the older negro girls 64 per cent. Fewer girls than boys failed to reach the white median in some one of these patterns as the percentages of those below the medians were: white boys 12 per cent, girls, 6 per cent; negro boys 18 per cent; younger negro girls 5 per cent; older 9 per cent.

The temperamental patterns obtained by using the adult as compared with the adolescent norms are so divergent that there seems to be valid ground for further investigation of possible differences either in traits or in the norms that must be used for different ages, or in both. The predominance of the B and the AB patterns according to the adult standards (two-thirds of the negro and four-fifths of the white score are at or above the medians in these patterns) is as clear as the more diversified groupings according to the adolescents standards (less than one-fourth are found in the A and AB patterns). According to the white adolescent standards, about one-half of the negro boys, one-third of the negro girls, and one-fourth of the white children belong to the single-type patterns. It is evident that the curves of the average percentiles (fig. 1) for the white and negro children are much more similar than is either to the adult curve.

A comparison of these results with those of McFadden-Dashiell[4] are of interest. Both agree in finding the negro slower in movement, having the same or slightly greater inertia, greater motor impulsion, and the same interest in detail; they disagree in finding the negro having about the same volitional perseveration and coördination of impulses, and less motor inhibition. The latter trait is one in which there seems a distinct decrease with age among the adolescents tested, perhaps on account of the type of older children that are retarded according to school grades. It seems also that the

[4] Racial Differences as Measured by the Downey Will-Temperament Test, Jour. Applied Psychol., VII, 1923, pp. 30–53.

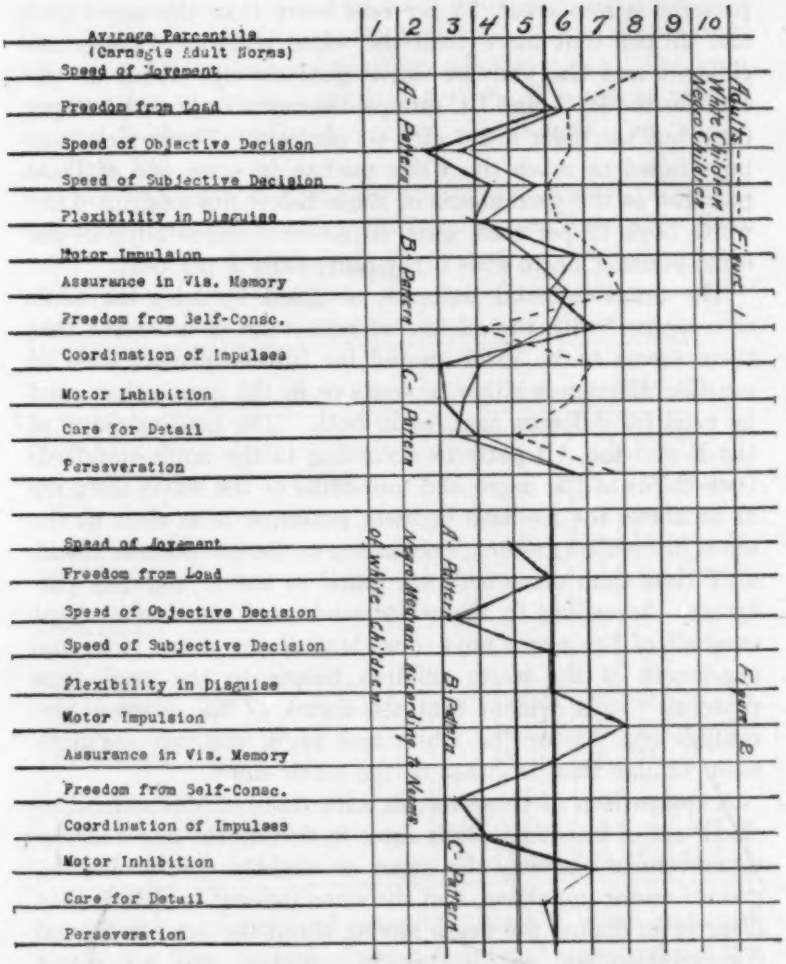

FIG. 1. Curves of average percentiles in Reams Downey Will-Temperament Test for adults----, white children——, negro children——.

FIG. 2. Negro children medians below or above heavy horizontal line which represents norms of white children.

younger negro children show more speed and less aggressiveness than the older. The degree of intelligence, amount of school training and maturity may all combine to produce such differences. A similar variation appears between the teachers and the college students.

The chief disagreement of the results from these adolescents with the McFadden-Dashiell findings is in regard to the mobile (A) and deliberate (C) patterns. Neither according to their own norms or those of the adults are the white children clearly superior in these two patterns. The negro boys have a distinct advantage in the A pattern, while the negro girls have exceedingly low percentages in this group. In the C pattern the negro children average lower in some of the tests and higher in others by both the adult and the white children norms. According to both adult and adolescent norms, these white children surpass in two types; the mobile combined with the deliberate and a combination in which all three patterns are above the median; but the negro somewhat in the aggressive type. In the other patterns, the two groups taken as a whole, show no distinct differences. As to variability, the results of these tests agree with the investigation just mentioned in finding the negro slightly more variable.

A recent comparison of these patterns with Jung's types[5] finds high scores in the A pattern corresponding to the extravert and high scores in the C pattern corresponding to the introvert type. The negro children have lower medians in the speed tests, but not less flexibility, greater interest in detail or perseveration than the white children, so there is no distinction as to introversion or extraversion in the middle ranges of scores. At the lower and higher extremes, the tendency is toward extraverted patterns on the part of the white children and introverted on part of the negro, according to the scores on the tests.

The revised form[6] of the Woodworth-Mathews question-

[5] Downey, J. E., Jung's "Psychological Types" and Will-Temperament Patterns, Jour. Abnormal Psychol., XVIII, 1924, p. 345.

[6] Mathews, E., A Study of Emotional Stability in Children, Jour. Delinquency, VIII, no. 1, p. 39.

naire was tried by 81 white and 302 negro children, all in the eighth grade of the public schools. The number of unfavorable responses ranges from 3 to 25 for white boys, from 1 to 37 for white girls, 1 to 34 for negro boys, 3 to 38 for negro girls. The percentile distribution of unfavorable responses is as follows:

	WHITE				NEGRO			
	Number	25 percentile	Median	75 percentile	Number	25 percentile	Median	75 percentile
Boys	48	7	10	14	95	8	13	18
Girls	33	10	14	19	207	12	17	22
All	81	7	12	17	302	11	16	21

This shows a greater frequency of such reactions on the part of girls than of boys and in the case of negro than of white children. Moreover, 8 per cent of the white girls (and 2 per cent of the negro girls) reach or exceed the highest score of the boys.

In regard to the responses to the 75 questions as compared with Miss Mathew's percentages for unselected boys and girls, the outstanding fact is general agreement. The slight variations may be of interest. These children give more unfavorable responses to four but fewer to twelve questions than did Miss Mathews' group. The negro children, in addition to similar differences as to white children, have higher percentages for seven additional questions and lower for two. Social restrictions offer some explanations for variations to questions concerning fear of dark, nobody understands, other people like you less, what to do next, and seeing red when angry. Though there is higher frequency in case of some questions, there is also much more constricted range of unfavorable answers, and smaller average scores, so the results can hardly be used as an argument for greater emotionality on the part of these groups of children than was found in the case of Miss Mathews' unselected boys and girls.

In regard to the relation of age to the number of unfavorable responses, the numbers are too small to give more than an indication of trend, as can be seen from the following means:

	WHITE				NEGRO			
	Boys		Girls		Boys		Girls	
12–13–14 years old....	(27)	10.6	(38)	15.9	(33)	14.2	(48)	17.1
15–16 years old.....	(6)	8.5	(9)	10.0	(62)	12.3	(159)	17.8

There seems to be a decrease with age, except in case of the negro girls, whose average remains almost constant at every age. The difference is also less between the younger of the white and negro girls than it is between the similar groups of boys.

The questions which elicit the greatest difference in responses between the white and negro children are the following, for which the negro percentage exceed the white by about 13 per cent or more:

8. Uneasy to cross a bridge
9. Going into tunnel or subway
11. Afraid during thunder storm
13. Afraid of dark
22. Habit of stuttering
28. Food makes you sick
40. Nobody quite understands you
46. Things get misty before your eyes
48. Pains in any part of the body
54. Eyes often pain you
64. Uneasy in a small room with the door shut

The white children have higher percentages for the following questions:

19. Do you dream of robbers?
20. Have the same dream over and over?
44. Idea that you are an adopted child
57. Have you often fainted away?
74. Feel you were very wicked?

The most popular questions (total percentage of unfavorable answers about 40 per cent or over) for both white and negro children proved to be:

11. Afraid of thunder storm
15. Afraid of noises in the night
17. Dream about your family
18. Dream about people being dead
19. Dream of robbers
29. Food so disgusting that you cannot eat it
32. Feelings hurt so badly that you cry
46. Things seem to get misty before the eyes
67. Great fear of fire

The percentage of unfavorable replies of both white and negro girls is considerably higher than that of the boys to the questions about:

9. Going into tunnel or subway
10. Afraid of water
11. Afraid during a thunder storm
14. Frightened in the middle of the night
15. Afraid of noises in the night
18. Dream about people being dead
19. Food that makes you sick
32. Feelings hurt so badly that you cry
64. Uneasy in a small room with doors shut

But the boys have the higher percentages for 5 (want to run away from home) and 25 (habit of twitching head, neck or shoulders).

A rough attempt was made to find the relationship between these three personality tests by comparing the number of scores above and below the group median of each test with every other. Of the white children who answered the Woodworth-Mathews questionnaire, 72 had also taken Pressey's X-O Form B. Those whose scores on the questionnaire were below the median and therefore by this test perhaps the more stable emotionally, had on the average smaller totals on tests I and II (wrongs and worries) and larger on test III (interests) than those with a higher frequency of unfavorable answers to

the questionnaire, and their deviations averaged higher on tests I and II and lower on test III. Of the 62 negro children who answered both the questionnaire and the Pressey X-O, those also averaged higher on the deviations in test I and II and lower on test III, whose scores were below the median on the questionnaire, but their totals were a little lower on test III, and about equal on test I and II. Since the deviations on test II (worries) are higher in the case of both white and negro children who give fewer unfavorable replies on the questionnaire, the two forms of testing apparently do not agree. However, if the modal words of this same group of children is used as a criterion for test II, the results agree better with those of the questionnaire.

The scores on the Will-Temperament Test IX of those above and below median on the questionnaire show that the children both white and negro who have the fewer unfavorable responses are on the whole less speedy and exhibit less load; but the white children also score lower on coördination of impulses and motor inhibition, while the negro children show the opposite tendency except the older girls, who also score lower on motor inhibition. As about 200 negro children took both tests, and only 81 white children, it may be that more weight should be given to the results of the former. In the case of the negro children, those who have the fewest unfavorable replies on the questionnaire show a distinct tendency toward less inertia, better coördination of impulses and less perseveration and somewhat less speed than those who give the greater number of such responses.

A similar comparison of the three patterns of test IX with the questionnaire gives the following results: The white children who have the lowest scores on the questionnaire tend to have higher scores on patterns B and C and the negro children only on pattern C. In both cases, there is no difference in the percentages of those above and below the median on the questionnaire as regards pattern A, the mobile type. Both white and negro children who score higher on the deliberative pattern of test IX, also give fewer unfavorable responses

to the questionnaire; the aggressive pattern B of test IX does not differentiate the negro, but is the most differentiating in the case of the white children.

A comparison of those above and below their group medians on X-O Form B and on test IX shows 20 per cent or more difference in the percentages as follows:

According to total scores. *a.* X-O I (Wrongs). Higher scores on coördination of impulses and lower totals for both negro and white.

b. X-O II (Worries). Higher scores on speed of objective and subjective decision correspond with higher totals on test II on the part of the negro children; no distinct differentiation in the case of the white children.

c. X-O III. Higher scores on assurance and higher totals on X-O III (interests) correspond for the white children and the negro boys. In the case of the negro children, higher scores on the speed tests of the Will-Temperament scale and higher totals on the Pressey Test occur together.

d. Higher scores on speed of objective decision and less deviation from the modal words of X-O I for both white and negro, but higher scores on freedom from load correspond with greater deviation for the white and less deviation for the negro; higher scores in perseveration with less deviation on the part of the white children.

e. Higher scores on care of detail and on perseveration occur together with greater deviations in X-O II.

f. Greater deviation from the Interest norms (test III) corresponds in the case of the white children with greater motor inhibition and in the case of the negro with greater speed of subjective decision.

IN CONCLUSION

The three personality tests used in this investigation show some significant agreements between parts of the tests. There are discrepancies for different age, sex, and race groups that may be partly due to unreliable norms. This is especially noticeable with reference to variations from the norms for total number of words crossed out in the Pressey X-O, Form B. Individual differences are, however, so striking that all three tests are valuable for diagnosis without regard to the normals.

The results give grounds for believing that there is need of investigating norms for different stages of maturity. An

attempt at obtaining adolescent norms for the Carnegie Test IX is shown in table 6. By using these percentile scores instead of the Carnegie norms, the profiles of the children of both racial groups are very much alike and markedly different from those of the adults tested. Similar relationships are shown as to variability. The standard deviations vary from 0.9 to 9.7 for the twelve tests, but there is no significant difference on any of the tests between the racial groups examined in this respect. The highest standard deviations (almost equal for boys and girls, white and negro) occur in the tests for speed of objective and subjective decision, care of detail, and assurance in visual memory.

The Pressey tests elicited greater variations between the racial groups than the other two tests and seem to reflect differences in social restrictions and taboos. They also point to the importance of distinguishing between different forms of emotional responses, as the spread of emotionality may be more or less restricted in respect to anger, grief, fear, interests, in very divergent degrees in the same person, and perhaps for different groups. At any rate, the individual who has the greatest total on one of the Pressey tests may have a very low total on another. So also different groups show marked variations in totals while the deviations for each test remain relatively constant.

The differences between the racial groups examined can not be summed up in such generalizations as more or less emotional, energetic or unstable, or even by total scores on the tests. So many of the variations found may be due partly to lack of speed in writing and reading that very precise conclusions are out of place. Educational tests given to these same children have resulted in much lower scores in these subjects for the negro than for the white pupils. As is true of other forms of measurement, the investigator is impressed with the need of repeating the personality tests for several years with the same groups and combining them with studies of well-defined habits, in order to ascertain the significance of the results and obtain reliable norms. Thus it may be possible

to discover what the trait investigated may mean in different situations, for these as well as other personality tests show that fruitful comparisons are dependent on varying degrees of these complex characteristics rather on the possession or non-possession of the traits. It may be added that the tests used have proved of considerable value in diagnosing difficult school and social adjustments. It is the accurate determination of these special situations that must await further study.

PERSONALITY AND VOCATIONAL ACHIEVEMENT

PART II

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(*Continued from June 1925*)

A senior having completed a four-year record which was uniformly of such a nature as not to reflect great credit on him was heard to remark, "Yes, I admit that my record here is nothing to be proud of, but wait till I get out in real life and I'll show these professors that they have me sized up all wrong." And the instructor himself knows that college life after all puts the student to many tests and makes of him numerous requirements which often seem to be quite irrelevant to the later life and activities of the student. He knows all too well that the student who has been branded as a failure in his college work has ofttimes caused his former college instructor considerable embarrassment by his own subsequent success in one field or another. In fact, there is an occasional instance in which a student has been granted permanent leave of absence from the college because of scholastic delinquency who has later made a marked success in some useful vocation.

Again in various walks of life how often one hears the statement, "Well, I've been making a failure so far, but I've turned over a new leaf and from now on . . . ." and so on. But just how often does an individual turn over a new leaf and keep it turned? How far does the student's record in college predict his performance in life? To what degree are those personal traits by which a young person is known to his associates permanent and how will they affect his success in the world of affairs? The chief difficulty in answering such questions lies in the absence of any generally accepted definition

of the term success. It is likely that in the popular mind the word, *success*, is practically synonomous with the word, *income*, and it is quite useless for idealists to point out that one's income is never a measure of its possessor's happiness or usefulness to society so long as most of the very persons who are engaged in pointing out this fact are nevertheless energetically devoting themselves in one way or another to the accumulation of wordly goods. Success is sometimes defined as the attainment of a worthy goal, but the difficulty with this notion of success is in the impossibility of agreement on what really constitutes a worthy goal. Certainly the accumulation of money may be a most worthy goal if the money is to be used in the improvement of the general health of mankind. Under certain circumstances almost any goal may be a worthy one. In the absence of an adequate definition of success or of the possibility of devising one, we shall find it preferable in our experimental work to indicate merely as specifically as possible the attainments or achievements of the various individuals concerned and the relationships of these achievements to other significant facts and conditions.

Vocational psychology is interested not only in methods of human analysis in order to aid the individual in the proper choice of a vocation but also in the determination of the human factors which are likely to be conducive to success in a given calling. For once such determinations are possible even within reasonable limits, society will be vastly more able to organize efficiently and satisfactorily its human forces; and the individual through the possibility of more intelligent planning of his life endeavors will be able to lead a happier, more useful, and more contented life. Moreover, through the determination of the most important personal traits for success in any given vocation it should be possible for education to organize its program to the greatest possible advantage of the individual and of society as a whole.

An attempt has been made by the author to determine what factors may be discovered in the young man's character or personality which would suggest his ultimate vocational

selection and at the same time yield valuable information concerning the traits essential to success in the various vocations which engineering college graduates enter. It should be said that the methods and plans used were not selected because they were believed to be the most adequate or scientific, but because they were apparently the only ones possible under the circumstances and did seem to contain promise of interesting scientific adventure for all concerned. Consequently, following up the rating experiment described in the first part of this chapter, five and one-half years after the graduation of group I letters of inquiry were sent out to the members of both groups I and II, requesting detailed information concerning their activities along the following lines: (1) Nature of work, (2) writings, inventions and special honors, (3) earned income, (4) miscellaneous activities. The letter requested that specific information be given along these lines for each year since the student's graduation. Responses were received from 21 of the 29 men in group I and from 15 of the 25 in group II. In the remainder of the discussion we shall refer to these two groups as groups Ia and IIa.

VOCATIONAL DISTRIBUTION OF THE MEN

Presumably there are certain characteristics of an individual's personality or of his college performance which would indicate in what general field of activity he will eventually find himself. For unless he does materially modify his typical and habitual modes of thinking and acting after his college days are past, we should expect him to shift about in his vocational activities until he finds a kind of work in which he can express himself in ways which he has already found best suited to his nature and consequently most satisfying. If he were entirely free from chance influences we may be very sure that this is exactly what would happen; but during the first five years after graduation, at least, apparently these accidental or chance factors play havoc with our conclusions or predictions as to the type of work in which individuals will engage. For example, we find five of our group engaged in

teaching despite the fact that not one of the men manifested any interest in this vocation during his college days. We may suppose that these men, being unable to obtain satisfactory positions in the fields for which they had specifically prepared, are simply marking time in the schoolroom until opportunities in their chosen fields open up. One man wrote that he was "just picking up a little ready money teaching while business in my line is a little dull."

The vocations represented by the two groups of men and the number engaged in each at the time of the inquiry are as follows:

Sales engineering	11
Telephone engineering	5
Teaching	5
Design work	3
Engineering research	2
Construction	2
Railway engineering	2
Estimating and appraising	1
Radio work	1
Bookkeeping and office management	1
Clerical work	1
Power engineering	1
Law	1

Twenty-eight of the men or a little over 75 per cent are in some kind of engineering work although in some cases, not the kind in which they expected or prefer to be, as their replies indicate. During the next five or ten years there will be considerable shifting about so that, as suggested above, most of the men will eventually get into lines of work which they prefer and for which they are by nature and training best fitted. There are naturally a few individuals who will discover that the work for which they have prepared and which they prefer is not at all suited to their abilities. It is clear that there is represented in this period of vocational adjustment a serious loss of time and effort to the individual and to society. Of course, the loss is small in such fields as engineering when compared with that in less highly specialized vocations.

As far as we can judge from a comparison of the men in the various fields there are no consistent or significant differences in their personalities, mental abilities, or scholastic records to which their present vocational choices can be ascribed. It is hardly to be expected that such differences would be very apparent in such a short time; but we confidently expect that

TABLE 7

Showing rankings of the men in group Ia in (1) personality, (2) general intelligence, (3) school grades, (4) income, five years after graduation, together with number of writings, inventions, etc., by each

INDIVIDUALS	PERSONALITY	GENERAL INTELLIGENCE	SCHOOL GRADES	INCOME	INVENTIONS, WRITINGS
A	1	2	2	1	
B	2	4	4	8	
C	3	17.5	7	5	
D	4	14	11	4	1
E	5	1	1	6	4
F	6	5.5	5	10	3
G	7	9.5	18.5	15.5	
H	8	12.5	6	2.5	3
I	9	7	12	13	1
J	10	16	14	7	
K	11	5.5	8	15.5	
L	12	11	21	2.5	
M	13	No test	10	12	
N	14	8	9	11	
O	15	12.5	16.5	9	
P	16	9.5	3	21	1
Q	17	3	13	19	
R	18	19	18.5	20	
S	19	20	15	17.5	
T	20	17.5	20	14	
U	21	15	16.5	17.5	

significant differences will appear with a longer period of observation when the men have had opportunity to become somewhat better located vocationally.

PERSONALITY AND INCOME

Tables 7 and 8 have been prepared to show the detailed rankings of the individuals in the two groups with reference

to personality, as determined by the rating experiment, general intelligence, as determined by the Army Intelligence test, school grades, as determined by the composite of the grades for the entire four-year college course, income, and writings and inventions. Since we have already discussed in the preceding section the relationships between personality, general intelligence, and school grades, we shall hereafter be chiefly concerned with personality, general intelligence, and certain phases of vocational achievement.

TABLE 8

Showing the rankings of the men in group IIa in (1) personality, (2) general intelligence, (3) school grades, (4) income five years after graduation, together with number of writings, inventions, etc. by each

INDIVIDUALS	PERSONALITY	GENERAL INTELLIGENCE	SCHOOL GRADES	INCOME	WRITINGS, INVENTIONS
A	1	8	1	3	5
B	2	No test	5	1	
C	3	1	2	8	1
D	4	5	4	11	
E	5	3	12	5	
F	6	12	10	12	
G	7	4	6	6	1
H	8	9	9	9	
I	9	11	7	2	
J	10	13	15	7	
K	11	14	11	4	
L	12	10	13	15	
M	13	2	3	13	2
N	14	7	14	10	
O	15	6	8	14	

Whatever may be said to the detriment of financial success as a measure of success in general it will readily be admitted that it does constitute at least one measuring rod for success and that it is very concrete and, therefore, very convenient to use as a basis of comparison among individuals. Further it may be safely assumed that most college graduates of the type we are here considering, that is, men who do not come from very wealthy homes, will be concerned chiefly in getting

ahead financially during the first few years after graduation. We shall, therefore, assume that the relative incomes of these men make at least one substantial basis for the estimation of their success. Too much must not be concluded, however, from such comparisons for it must be borne in mind that many factors over which one has little or no control may affect his income. Even the value of the dollar as measured by what it will buy of life's necessities differs materially in different sections of the country. Again a temporary period of prosperity or depression in a given industrial field is no

TABLE 9

Showing the median incomes of the upper, the middle, and the lower thirds of groups Ia and IIa according to personality

PERSONALITY	GROUP Ia	GROUP IIa
Highest third	$3,000	$3,000
Middle third	2,316	2,700
Lowest third	2,076	2,040

TABLE 10

Showing the median incomes of the upper, the middle, and the lower thirds of groups Ia and IIa according to general intelligence

GENERAL INTELLIGENCE	GROUP Ia	GROUP IIa
Highest third	$2,400	$2,856
Middle third	2,580	2,640
Lowest third	2,100	2,856

doubt promptly reflected in the salaries paid to employees. In any event it will be necessary to have a much larger number of cases than we are here considering in order to make final deductions. The material, however, is highly suggestive and is believed to be worthy of some consideration.

Of the 21 men in our first group the highest annual income five and one-half years after graduation is $4050, the lowest $1920, and the median income is $2604. Similarly in group IIa the highest annual income four and one-half years after gradua-

tion is $7200, the lowest $1740, and the median income $2700. Now dividing the two groups each into three equal divisions on the basis of the ranks of the individuals in personality as shown in table 9 we find the median income of the highest third in group Ia to be $3000, of the middle third $2316, and of the lowest third $2076. Again in group IIa in the same table we see the same tendency for the men with the better personalities to earn the larger incomes. Now turning to table 10 showing the relation between general intelligence and income we find a somewhat different situation. In Group Ia the largest incomes are received not by the most intelligent group, but by the middle third; while in group IIa there is no

TABLE 11

Showing the correlations between (1) personality, (2) general intelligence, and (3) school grades and the incomes of the men in groups Ia and IIa five years after graduation

	INCOME AND:		
	Personality	General intelligence	School grades
Group Ia	0.72	0.18	0.32
Group IIa	0.46	−0.18	0.19

difference between the median incomes of the highest and lowest thirds.

The general tendencies of tables 9 and 10 are clearly borne out by Table 11, showing the correlations between income, personality, general intelligence, and school grades.

Since it is entirely obvious that one's personality is in some way closely related to his earning power, we may now ask how far each of the various personal traits is related to one's income. In group Ia where we have the more detailed analysis of personality, we find the 23 traits related to income in the following order and amounts of correspondence:

Accuracy.....0.77
Originality.....0.75
Address.....0.72

Social, civic interest	0.72
Memory	0.69
Enthusiasm	0.68
Motor ability	0.65
Aggressiveness	0.62
Popularity	0.61
Sympathy	0.61
General ability	0.60
Reasoning ability	0.56
Tact	0.56
General information	0.53
Appreciation of humor	0.53
Self-reliance	0.48
Coöperativeness	0.47
Speed in work	0.47
Industry	0.45
Reliability	0.36
Neatness	0.30
Sincerity	0.29
Moral habits	0.23

ORIGINAL WORK

Approximately five years after graduation these two groups of men have produced a total of 22 different items or pieces of original work in the form of 14 scientific articles and technical publications and 8 mechanical inventions or devices that have received more or less recognition. In addition to this 3 men have done some writing of a non-scientific character for the publications of the firms with which they are associated, while each of 2 others has received special honorable recognition in his work. Reference to tables 7 and 8 shows that most of this original work has been done by men above the average in personality in each group although the relation is not strikingly close. The average personality ranks of the 6 men in Group Ia who have made some original contribution is 8 and in group IIa the corresponding average rank is 6. In each group then the average personality of the writers and inventors is slightly above that of the group as a whole. Recalling the traits which enter into the make-up of personality in our experiment (see table 1) we should not expect a closer correspondence than is indicated.

We find about the same tendency to correspondence between original work and intelligence, objectively measured, in group Ia as between personality and original work, but in group IIa the correspondence between intelligence and original production is much closer, the average intelligence rank of the producers being three. In the case of school grades and original contributions the correspondence is closer, the average rank of the contributors in group Ia being 6.3, and in group IIa, 3. This is, no doubt, easily explained by the fact that good grades and original production both depend upon general intelligence plus certain personal traits to guarantee that the mental ability will be made to function.

It has often been observed that scientific investigation, writing, and research are not highly remunerative activities. This observation receives some support from what evidence we have here. In group Ia the average income rank of the writers and inventors is 9.3; while in group IIa it is 7.5. In other words, while these ten men who have already made some scientific contribution in their respective fields are somewhat above the average in their respective groups in general intelligence, personality, and school records, their incomes are not proportionately higher than the average. Here again the joy, satisfaction, and social recognition which the individual gets from such work evidently act as a partial compensation.

THE NORMALITY OF THE TWO GROUPS

It should be stated that the two groups of men who form the basis of this experiment are typical and representative seniors in a typical mid-western engineering school. We have checked their scholarship records very completely and find the average of group I to be less than 1 per cent above the average for all engineering seniors in the university. Group II is about 1 per cent below the average. It is frequently assumed that only the best individuals of a given group respond to such an inquiry as was sent to these men so that the replies are not precisely representative. This is apparently not true of these two groups. The average personality rank of the 21 men in

group I who replied to the inquiry is 15 or slightly below the average of the entire group; the average intelligence rank is 12, and the average scholarship rank 14. In group II the case is very similar. Of course, we cannot be sure that those who replied were not the most successful and prosperous men, but the figures just given do not warrant nor suggest such an assumption. On the other hand, they do suggest that the results are true and valid and are representative of the entire group.

CONCLUSIONS

It is possible by means of such a procedure as is outlined in this experiment, with certain refinements, to determine the relationships of the various personal and character qualities which enter into the composition of personality.

It is also possible to determine in a similar fashion the relative importance of various personal traits for success in different vocations. There is no reason why the relation of such traits and characteristics as weight, height, hours of sleep, punctuality, eating habits, use of profanity, and scores of others, to vocational choice and success should not be determined within reasonable limits.

A good personality is characterized by such traits as enthusiasm, accuracy in work, aggressiveness, and self-reliance; while such traits as neatness in appearance, appreciation of humor, and moral habits contribute but slightly. It must be borne in mind as has already been suggested that all our conclusions and the preceding one especially, are subject to the conditions of the experiment. The group is limited to men of a high grade of intelligence, generally; to men of similar training and experience; and to men largely engaged in fairly similar vocations. A larger number of cases and a longer period of observation of the men in the various vocations may modify somewhat our results.

There is apparently no relation within a group of highly intelligent men, for example, men whose I.Q.'s are above 110, between financial success and general intelligence as measured

by an objective test. It is entirely obvious that there is considerable correspondence between general intelligence and financial success if we consider all levels of intelligence from the genius down to the imbecile. It is also possible that within a given restricted field of activity, such as newspaper editorial work, or scientific research, there is some correlation between material remuneration and general mental ability.

In contrast to the lack of correspondence between general intelligence and financial success there is a fairly close relation between personality and income. The relation is indicated by a correlation coefficient of from 0.45 to 0.75.

College grades are somewhat less indicative of the student's ability to earn money than is his personality.

Such traits as accuracy in work, originality, address, social and civic interest, are important factors in determining one's income; while such traits as neatness, sincerity, and moral habits have little to do with the matter.

Such original work as mechanical inventions and scientific publications is largely produced by the most intelligent third of college graduates; the financial reward for such work is not commensurate with the high grade of intelligence necessary for its pursuit.

THE RELIABILITY AND RELATIONSHIPS OF THE COLGATE MENTAL HYGIENE TEST

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The Colgate Mental Hygiene Test is an extension of Dr. R. S. Woodworth's "Psychoneurotic Inventory" based upon extensive experimentation with normal individuals. The type of response has been designed in the present test so that it is possible to have a quantitative measure of the amount of deviation from normal in each trait. In addition half a hundred items dealing with introversion and extraversion have been added.

The test is in use as a "spotting test" to find those individuals who deviate most from normal in their indirect—and undesirable—emotional outlets. Occupational differences, racial, sex, and age differences are also under study.

The test can be taken in groups as well as individually. Each question (fig. 1) in the large type to the left is answered

18. Have you been inclined to work out things alone?	rarely asked for aid	worked mostly unaided	did not hesitate to seek aid	got help in most cases
19. What attention have you given dress and personal appearance?	unconcerned about fashions, etc.		selected mostly for appearance	close attention to dress

FIG. 1. SAMPLE QUESTIONS

There are 75 in B1 and 53 in C1

by making a check mark at the proper place along the dotted line. The check mark may be placed above one of the phrases or between them. The behavior for the past six months only

is considered, although the test may be used to have relatives describe patients as they were in adolescence.

The test is scored by means of celluloid stencils. These show the section of each dotted line in which a check mark indicates that the individual deviates from normal. This section has been determined experimentally from the distribution of check marks made to each question. It indicates that the individual under study is "more so" in the trait than three-fourths of the population studied.

The responses in which the subject deviates are marked with a colored pencil. The total of these colored marks is compared with a percentile chart to show how the individual compares with a normal group. If, for instance, there are 15 colored marks on Schedule C1 he is more introvert than 76 per centum of others. If there are 12 colored marks on B1 it indicates that he is more psychoneurotic than 30 per centum of others.

Complete test forms and percentile charts will be found in the Journal of Abnormal and Social Psychology for July, 1925.

The data to be reported were compiled and checked by the following students: F. S. Bambace, V. N. Barrington, J. W. Baumann, H. P. Bromfield, H. D. Bryant, D. DeNoyelles, I. H. Faulkner, L. B. Goodenough, A. W. Graning, A. R. Hedeman, H. K. Hunsicker, C. W. Jennings, S. B. Jones, J. S. Kaye, M. D. Livermore, W. C. McConnell, P. R. Martino, H. C. Millard, R. W. Moncrief, S. S. Munro, H. H. O'Connor, W. R. Patterson, D. Posson, W. E. Rice, M. L. Rofrano, H. I. Roll, C. J. Rutishauser, G. F. Swartz, H. Seltenrich, J. K. Smith, W. Spaid, L. C. Stark, F. Stanton, J. C. Stuart, M. B. Wilcox, Paul Fry, and Miss Muriel Cutten.

METHOD

This study of the reliability of Schedule B1 and C1 was carried on to find the possible error on the part of subjects in rating themselves and the general reliability of the schedules as tests of emotional stability. Several methods were used to test the reliability of the schedules:

1. On Schedule C1 there are five sets of duplicate questions. These were compared with one another.

2. In Schedule C1 the first half was correlated with the second half. In Schedule B1 the scores in the first half of each section were correlated with the number of symptoms on the second half of each section for the entire schedule. The two

FIG. 2

schedules were also correlated with one another and with scholastic attainment.

3. In addition to this a group of 88 subjects was selected at random to take the inventories a second time two weeks after they were first tested.

DATA FOR SCHEDULE C1 (INTROVERSION-EXTRAVERSION)

The correlation between the total number of symptoms the first and second time of taking the inventories was $+0.674 \pm 0.039$. This correlation shows a fair degree of reliability. (All correlations are computed by Pearson's product-moment method.)

The first and second half of the schedule correlated $+0.450 \pm 0.003$ with each other. This correlation is not as high as the one found when the first and second times of taking were correlated but shows a definite relationship between the two parts, although a higher one is to be desired.

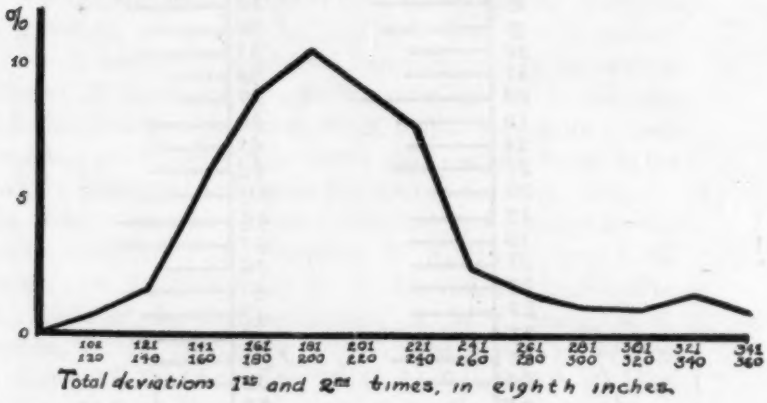

FIG. 3

A study of the inventories taken two weeks apart shows the average misplacement of the check marks for each question to be as shown in figure 2. The length of each line represents the actual average deviations of the second from the first check mark.

Figure 3 shows the distribution of the total of these deviations appearing on each subject's schedule. All deviations on each individual's schedule were totalled giving the total number of $\frac{1}{8}$ inch deviation which appeared on the schedule. This curve shows an approximately normal distribution of total deviations made by those who took the inventory the second time. Some

individuals are much more reliable than others, the best deviating on the average only $\frac{1}{8}$ inch and the worst $\frac{3}{4}$ inch.

Figures 4a, 4b, 5a, and 5b show a comparison of the duplicate questions on Schedule C1; 4a, 4b, and 5a are for 488 men sub-

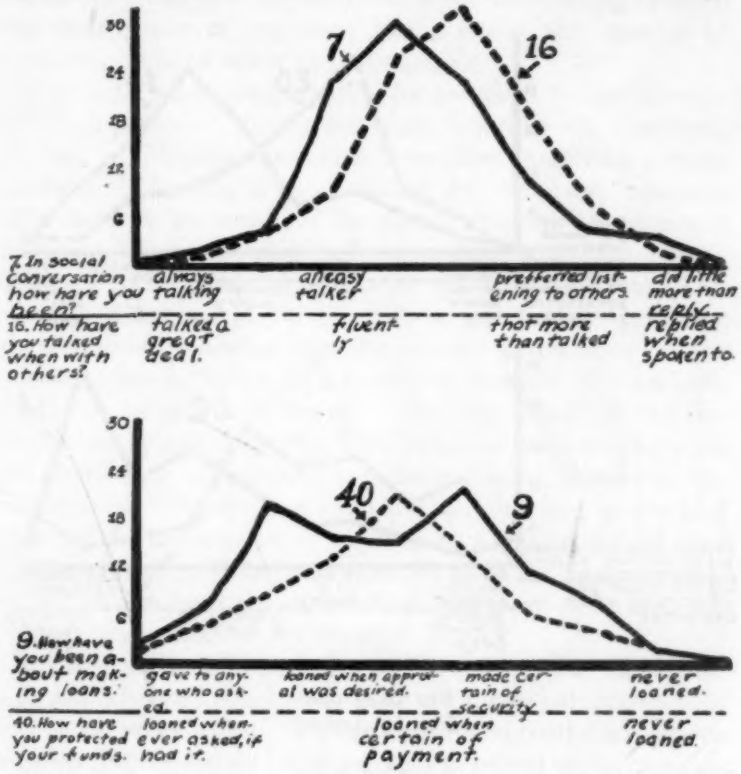

FIG. 4a (Upper)
FIG. 4b (Lower)

jects and 5b is for 258 women subjects. There are five sets of duplicate questions. The wording of each set of these questions is very similar. In some sets there is a difference in the number of qualifying phrases beneath the rating lines, and in all the "good" ends are reversed.

The questions compare favorably. If the responses were haphazard the distribution curves illustrated would have approximated normal distribution curves more closely than they do. The fact that they tend to follow the phrases rather than a normal distribution is a point in favor of the method.

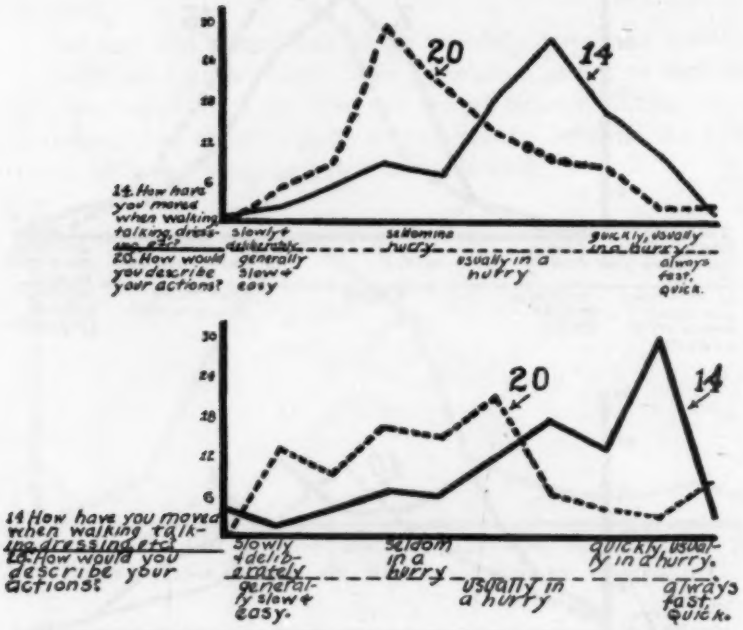
20
14
14. How have you moved when walking talking, dressing etc.
20. How would you describe your actions?
slowly + deliberately
generally slow + easy
seldom in a hurry
usually in a hurry
quickly, usually in a hurry
always fast, quick.
20
14
14 How have you moved when walking talking dressing etc.
20 How would you describe your actions?
slowly + deliberately generally slow + easy.
seldom in a hurry
usually in a hurry
quickly, usually in a hurry.
always fast. quick.

FIG. 5a (Upper)
FIG. 5b (Lower)

Further, if the responses had been largely haphazard the distributions for each question would have been practically the same. To illustrate this point figure 5b may be consulted. In both these questions the high point of the distribution is over the phrase "usually in a hurry" rather than being in the middle of the line for both questions as one would expect if the curve approximated a normal distribution curve. In figure 4b for questions 9 and 40 there is a considerable difference in the

curves. There are two high points on the curve for question 9 and one on the curve for question 40. On the questions themselves the wording is very similar but on the rating line question 9 has four qualifying phrases below the line while question 40 has three. This goes further to show the relationship between the distribution of responses and position and number of qualifying phrases below the rating line.

Figure 5b shows similar curves for questions 14 and 20 with the high points of the curves again following the qualifying phrases. Both these questions have three qualifying phrases beneath the rating line. Question 14, however, measures $1\frac{1}{2}$ inches from the middle of the phrase, denoting a symptom of introversion to the middle of the middle qualifying phrase. Question 20 measures $2\frac{1}{2}$ inches for the same distance. This shows a difference of 1 inch. These two middle qualifying phrases show somewhat opposite traits. In question 14 the middle phrase is "seldom in a hurry," in question 20 the middle phrase is "usually in a hurry." The high points of the two curves are $1\frac{1}{2}$ inches apart. This indicates a relation between the distribution of responses and the qualifying phrases on the rating lines. The distance from the introvert end to the high point of the distribution of the responses of question 14 is to the corresponding distance for question 20 as the distance of the middle phrase from the introvert end of question 14 is to the corresponding distance for question 20.

Questions 7 and 16 in figure 4a show very little difference. The same general conclusions as in the above paragraphs hold true in these questions. The high points on both distributions are over approximately the same point in regard to the meaning of the qualifying phrases.

These data show that Schedule C1 is fairly reliable. The correlation of $+0.45$ between the first half and second half of the schedule show that an abbreviated schedule cannot be used and the r of $+0.69$ after two weeks shows some revision is needed in this schedule. A valuable hint in revision can be gained from the material on duplicate questions. These questions show that great care used in selecting the qualifying

phrases beneath the rating lines would greatly increase the reliability of the test. The data from the second testing can be used to find out which phrases are the unreliable ones.

No data have been compiled as to the reliability of the test with women subjects. If, however, the differences which show between the two sexes in the comparisons that were made on duplicated questioning hold true in all comparisons a difference is likely to appear here also. The women subjects have shown a greater tendency toward introversion. This may be because they have rated themselves more closely or perhaps they are more honest with themselves in their rating. Data are being gathered on this point by Miss Muriel Cutten and will be published later.

DATA FOR SCHEDULE B1 (PSYCHONEUROID)

The average deviation for each question on B1 is graphed in figure 6 as for C1 in figure 2. An average of all these questions gives 3.8 eighth inches, or very nearly ½ inch, as the average distance which one may expect the check mark on the second test to deviate from the mark made on the first test.

The disparity in questions 100 to 132 is the greatest in the schedule. In the case of questions 401 to 407 there is little variation. This seems to be accounted for in the fact that there was little evidence of a normal distribution on these questions which centered around symptoms of hysteria. The check marks were bunched at one end of the rating line. An inspection of this figure shows striking differences among the questions on B1 as to the accuracy of the subjects in rating themselves on successive tests.

A correlation between the total symptoms on B1 the first time of taking and the second time showed r $+0.85 \pm 0.019$. Another correlation was made leaving out section IV of the schedule. This showed an r of $+0.815 \pm 0.023$. It is evident that the lack of disparity in section IV brings the reliability of the whole schedule to a higher point when it is taken as a whole. The first half of Schedule B1 correlated $+0.79 \pm 0.02$ with the

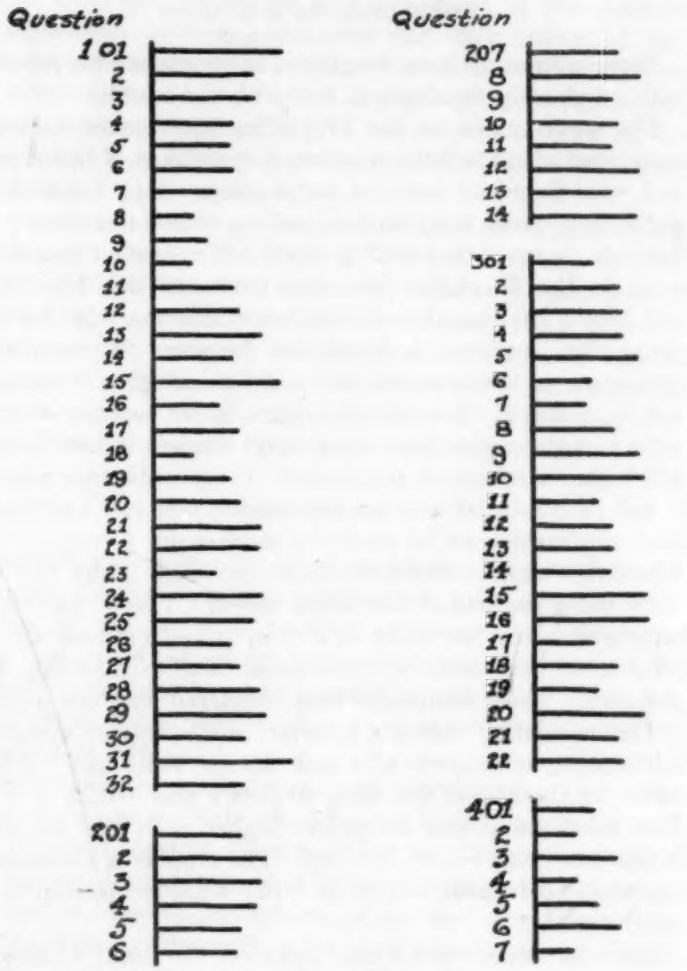

FIG. 6

second half of the schedule. The scores on section I of this schedule (Psychasthenoid) were correlated for the two times of taking the test. r in this case was equal to $+0.746 \pm 0.03$.

MISCELLANEOUS RELATIONS

Some interesting facts were found in correlating the schedules with scholarship, intelligence, and with one another.

The scores made on the Thorndike Intelligence Test were correlated with the total number of symptoms of introversion and were found to have no relationship. Two hundred and eighteen subjects were used in making this correlation; r was found to be equal to $+0.02 \pm 0.009$. It is evident that a high score on the Thorndike Test does not mean that the subject will have a large number of introvert symptoms. In this same connection, however a correlation between the number of symptoms of introversion and scholarship gave r equal to $+0.35 \pm 0.069$. A student having a larger number of symptoms of introversion than the average student is also likely to rate higher in scholastic attainment. It is possible that Schedule C can be combined with an Intelligence test and weighted so that scholarship can be predicted much more accurately than with either alone. Experimentation on this is under way.

By using one end of the rating line of C1 as a symptom of introversion and the other as a symptom of extraversion, the number of symptoms of introversion and extraversion were obtained. These symptoms were correlated with one another.

The correlation between introvert and extravert symptoms in the group of subjects who took the test twice was -0.36 ± 0.06. In the case of 288 men subjects r was -0.22 ± 0.141. This relationship was somewhat higher with 268 women, r in this case being -0.45 ± 0.003. The number of extraversion symptoms correlated -0.19 ± 0.078 with scholarship in the case of men.

No relationship was found between the total number of symptoms on B1 and scores on the Thorndike Intelligence test. Records of 203 men subjects were used in making this correlation; r equalled $+0.008 \pm 0.047$. With women this r was -0.12 ± 0.06.

The correlation between total symptoms on Schedule B1 and scholarship was $+0.074 \pm 0.082$ with men. The same

records were used in making this correlation as was used in the correlation between scholarship and introversion. r was also computed between the number of neurasthenoid symptoms and scholarship and the number of psychasthenoid symptoms and scholarship. In the former r was $+0.085 \pm 0.08$, in the latter $+0.019 \pm 0.08$. These are both the equivalent of no correlation.

A correlation between the total number of symptoms on Schedule B1 and on Schedule C1 showed a relationship of $+0.49 \pm 0.02$. A student high in the number of symptoms of introversion also tends to run high in psychoneurotic symptoms.

These correlations seem to show that the schedules can be made into a valuable aid to administration problems and the selection of personnel. Findings on this will be given in later papers from the Colgate University Psychological Laboratory.

CONCLUSIONS

These data show that the schedules are reliable enough to use in making group comparisons, such as comparing one class with another or one age with another or even smaller divisions. When one attempts to draw conclusions, however, or to establish a difference between individuals when one has 15 symptoms of introversion and another has 17 symptoms, obstacles are certain to be met.

There is evidence in the data presented in this paper that some of the questions in both schedules are highly unreliable and need revision. Section IV of Schedule B1, the section dealing with hysteroid symptoms, is of little value in its present form. The lack of hysteroid symptoms on the part of subjects may be data showing that college groups are composed of people tending more toward introversion than the average person and as a result do not develop the neurosis of extraversion or hysteria.

From the data at hand Schedule B1 is shown to be more reliable than Schedule C1. The data indicate a relationship between the number of questions in the schedule and the reliability. Schedule C1 is two-thirds as long as Schedule B1 and not quite two-thirds as reliable as Schedule B1.

TYPES OF WORK

A Note on Vocational Interest

DOUGLAS FRYER

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In vocational guidance and personnel selection practical devices for personality and occupational analysis are frequently used, of necessity, in the absence of scientifically established methods of work. A concept of practical utility, often given considerable prominence in vocational prognosis, is embodied in the words "types of work." This paper deals with types of work in the study of the worker's interests. The question is raised: How valuable is this concept of types of work? Is it of prognostic significance for vocational guidance or personnel selection?

In 1920 the writer determined to put this concept of types of work to the practical test of the vocational office in the study of interest. The purpose was to establish the prognostic value of interest in types of work.

Occupations were classified into two large groups as they seemed to appeal to interest: (*A*) the *humanics*, work with people and (*B*) the *mechanics*, work with things. Later the humanics was subdivided into two groups: *concrete humanics*, work directly with people, and *abstract humanics*, work indirectly with people; the mechanics was subdivided into two groups, *concrete mechanics*, work directly with things and *abstract mechanics*, work indirectly with things, or with the symbols of things. This classification appears below as it was presented verbally by the vocational counselors to a group of 200 counsel subjects and as presented in questionnaire form to 513 employment applicants.

Classification of types of work

A. *Humanics*, work with people:
   1. *Concrete humanics*, work directly with people, influencing, advising, directing people, like the buyer, the salesman, the executive in direct contact with the employed staff, etc.
   2. *Abstract humanics*, work indirectly with people, promoting and forming policies, ideals, and organizations for people to work or live by, like the publicity man, the advertising writer, the journalist, and the executive not in direct contact with the employed staff.

B. *Mechanics*, work with things:
   3. *Concrete mechanics*, contact directly with the objects of work, manipulating the tools and machinery, dealing with the things themselves, like the mechanic, the construction worker, the farmer and a great deal of the work of the engineer.
   4. *Abstract mechanics*, work with language and figures, dealing with the symbols of things, like the accountant or bookkeeper, the draftsman and the bank teller.

This classification of types of work was tried out as the regular part of the counsel process in a vocational office in New York City. According to the judgments of the subjects, following a brief description of the types of work, these 200 subjects divided themselves on the basis of their interests as shown in table 1.

Quantitatively this table appears to indicate that individuals can usually make generalized interest distinctions of the sort called for in classifications of types of work.

A qualitative analysis of this experiment based upon the reports of the counselors gives another aspect. It was evident in the discussions that there was a confusion on the part of the subject whether he was estimating his interest in the type of work or his ability in that type of work. Confusion between interest and ability was common. It became evident to the counselors that it was practically impossible for the subject to distinguish in his estimate between ability and interest with any high degree of reliability.

Furthermore, the subject often failed to get the meaning of

the general concept represented in the particular type of work. If he had had experience in *any* of the occupations included in the type under discussion his judgment seemed to be based upon that. His judgment seemed, in so far as it pertained to interest, to be based upon the feeling accompaniment to the thoughts of this particular task. This is in accord with our understanding of conscious processes. There can be very little feeling accompaniment to the concept. But when the

TABLE 1

GROUPS		NUMBER	PER CENT
Humanics:		111	55
Concrete humanics	57		
Abstract humanics	23		
No distinction*	31		
Mechanics:			
Concrete mechanics	14	72	36
Abstract mechanics	47		
No distinction*	11		
Both †		17	9
Total		200	100

* No distinction between the concrete and abstract was requested.

† Seven of these individuals designated their interest as in both abstract fields, three designated it as in both concrete groups, five as in both abstract mechanics and concrete humanics, while two were unable to chose.

concept is represented in consciousness by the idea or percept there can be any amount of affective elements.

Lack of knowledge of the occupations frequently caused the subject to come to exact judgments, of precise but highly superficial nature. Such statements as these would follow the counselor's description of types of work: "Oh I like to deal with people. . . . . I like to have the finished product in my hand. . . . . I want to be out in the open in mechanical work. . . . . I have a mechanical bent.

. . . ." But below this superficial judgment there would be absolute lack of understanding of the work involved. A discussion of the nature of work would bring an "informed" ignorance that would make any judgments as to types of work impossible. Fortunately for the quantitative record given above the subjects' judgments were recorded in the first part of the interview or it would have been impossible in many cases to secure any record.

The quantitative results appear lacking in significance when subjected to a searching analysis. These subjects do not seem to be able to generalize upon their interest in types of work, except in the most superficial fashion.

There is offered, however, a piece of suggestive evidence. The classification of types of work offered the subject a psychological picture of the vast scope of occupational endeavor. It became the starting point for discussion of specific occupations and it served as the basis for later occupational orientation. While it lost its meaning as types of work in the discussion it was suggestive to the subject in commencing a vocational analysis from the point of view of interest.

Further study of the significance for vocational prognosis of the concept of types of work was later carried on with a group of 513 subjects representing over 100 occupations, all applicants at a commercial employment agency in New York City. This study was made by means of a questionnaire containing questions relating to interest in the types of work classified above. Other questions were asked upon the questionnaire and of the 513 returns only 440 answered the questions relative to interest in types of work, indicating probably that the distinctions called for were too difficult for some. Of the 440 subjects for which answers were received 209 stated that they preferred work in both the humanics group and the mechanics. Thus of the 513 subjects 53 per cent in all failed to make a distinction between these two large groupings of types of work.

Of the 440 subjects answering the questions upon types of work the results are given in table 2.

Forty-eight per cent of the group that responded to the questions failed to distinguish between their interest in work with people or with things. Two sets of questionnaires were used with this group, the first set failing to contain the abstract and concrete subdivision of the humanics, thus accounting for the large group making no distinction there.

The quantitative results from the two samples, the counsel subjects and the employment applicants, are distinctly different. Only 9 per cent of the former sample failed to make the distinction between the humanics and mechanics groups

TABLE 2

GROUPS	NUMBER		PER CENT
Humanics:		146	33
Concrete humanics	63		
Abstract humanics	42		
No distinction*	77		
Mechanics:		85	19
Concrete mechanics	43		
Abstract mechanics	35		
No distinction	7		
Both humanics and mechanics		209	48
Total		440	100

* No distinction called for in most cases.

while fully 50 per cent failed to do so among the employment applicants. There are two possible explanations of this difference. With the counsel group a discussion of the meaning of the distinctions, with specific occupational illustrations, was possible. The subjects could thus be influenced to some sort of choice and the interpretation of the counselor could play a large part in recording the decision of the subject. The qualitative analysis of the counsel subjects suggest that the explanation has considerable factual basis.

The other explanation is that better educated and more

intelligent subjects are able to make these general distinctions called for by the classification of types of work. The sample composed of counsel subjects represents a distribution of intelligence on the Army classification of three per cent in the inferior intelligence groups, seventy per cent in the superior intelligence groups and the remainder in the average group, while for the employment group the intelligence distribution is much lower, with the median just over the line of the high average intelligence group. The latter group, composed of individuals drawn from over one hundred occupations appears to be more representative of the general male population in intelligence. A similar difference, but not so great, appears between the two groups in education.

In the sample composed of employment subjects, where there are sufficient numbers for a comparison between those making a choice for humanics or mechanics and those choosing both, there is a slight indication that the more intelligent and the better educated are inclined to choose *both* work in the humanics and the mechanics. Apparently education and intelligence are factors influencing the decision by causing a disinclination to choose between the two types of work. It is possible that greater knowledge of possibilities in both fields enters to prevent the choice among the better educated group.

Out of the intelligence and educational analysis of the quantitative results of both samples there appears a distinction between the abstract and concrete work. Intelligence and education are factors in causing the choice of abstract rather than concrete work. The more intelligent and better educated subjects making the distinctions called for choose work of an abstract nature to a marked degree. This is found to be true in both the humanics and mechanics group.

SUMMARY

From this attempt to grapple with the problem of interest in types of work the following conclusions arise:

1. Individuals are unable to make any generalized voca-

tional interest distinctions of significant value for vocational prognosis. Neither intelligence nor education are important factors in such decisions. Interest, which may in this instance be defined as the feeling of an individual toward certain occupational endeavors, cannot be expressed toward anything so general as a type of work.

2. Types of work based upon fields of occupational interest, used solely as a logical classification of work, can well serve as a means of orientation in vocational counsel where the information process must necessarily be from the general to the specific. On the other hand, as psychological types of work, these classifications appear to be of as little significance as the classifications of types of mind, a concept which has never yet been able scientifically to establish its right to exist.

PHENOMENAL MEMORY IN ITS BEARING UPON VARIOUS MENTAL TESTS

A Case Report

FRANCES E. OTIS

Letchworth Village, Thiells, New York

Among the patients at Letchworth Village at the present time is one who merits particular study and who well repays an individual for the time spent in working with him. Mark, a nineteen-year-old boy, has a remarkable memory and recalls with facility anything which has been taught him—dates, names, places or events. Geographical names of obscure and little known places, dates of significant or insignificant historical facts, names of important or unimportant persons, if once known are never forgotten.

The question immediately arises as to the nature and cause of the mental defect or variation in such a boy. At once we arrive at a blank wall. There seems to be slight indication of the underlying cause in this case and a question exists as to the nature of the disorder. The family are of German Jewish origin of fairly good social class. There seems to be nervous instability on both paternal and maternal sides, the father having had an involutional melancholia and the mother having been neurotic. Nothing unusual is known of the prenatal history of Mark himself. Early developmental history shows definite retardation—the child not walking until one and one-half years or talking until three and one-half years old. The probabilities are that the defect, if defect it really be, is not a secondary one. But is it a true mental defect, or is it a psychosis, or perhaps a brain disease of obscure origin? The diagnosis in the case is extremely doubtful, but aside from that, the fact of his unusual talent and his social inadequacy still remain.

The patient was a behavior problem from an early age—was careless about his personal habits, untidy, and difficult to work with. He was sent to kindergarten at six and to public school at seven. Upon the death of his mother when he was ten years of age, he was sent to a boarding school since none of his relatives would care for him. Here he attended public school for over five years. He was finally sent to a Farm School in New Jersey where he stayed but a month. Supervision in this school being more lax than at boarding school, Mark immediately fell into difficulties trying to make decisions for himself. At the boarding school he showed anti-social sex tendencies, was easily led, and demonstrated his inadequacy to decide for himself or carry out plans. After his removal from the Farm School, his uncle procured work for him in a paper concern, but this experiment proved a total failure. He was then sent to Bellevue for observation and after four weeks was committed to Letchworth Village.

Our next move is to discover what has been observed in this boy since his admission. His physical examination upon admission was essentially negative. He has the stooped posture and somewhat shuffling gait characteristic of a mental defective. His personality charting shows him to be of a more or less cheerful and calm temperament, sluggish almost to the point of laziness. He is alert to his environment, aware of what goes on around him, is fairly sociable, coöperates almost too well, and is respectful and tractable. He is, however, a bit egotistic, and is underhanded in many of his dealings. He is, moreover, a definite homosexual. This is quite evident both from his previous history (the anti-social sex tendencies referred to being an attack upon a younger child) and from his institutional life. During his stay at Letchworth Village he has been involved in several affairs of a grossly homosexual nature. Aside from these definite manifestations, he shows the general characteristics of a homosexual. He is subservant, overly anxious to please and apt to do more than he has been asked to do. He fails utterly in tasks which are of fairly long duration, though of a simple nature, which carry him away from those in

authority but succeeds in those tasks which are quickly done and involve a personal contact. For this reason he is of little real value in the institution though he works fairly well around the cottage, and aside from a few instances where his anti-social sex tendencies have been displayed, causes little real difficulty. He has a wide general information, reads the daily newspapers intelligently, can converse in a manner which far surpasses that of the ordinary defectives and shows a relatively good command of language.

With a boy possessing a capability such as this, what can be expected from the use of various mental tests? Would this extraordinary capacity affect the tests and to what extent? If our results show that this ability tends to give a high mental age do we then agree that he is not in any sense a mental defective despite his apparent failure along other lines?

Upon admission Stanford-Binet test gave Mark a mental age of 12^{11}, Intelligence Quotient 81. This result, however, can be immediately discarded. His uncle not wishing him to be rated as a mental defective coached him on the answers to the Terman test and due to his remarkable memory Mark was able to secure this rating. Here is a practical demonstration of his unusual ability, but no rating of his true mental capacity. It is interesting to note that on a mental test given February 29, 1920, two years prior to the one above mentioned his mental age was the same 12^{11} and his Intelligence Quotient 90 due to lower chronological age. A mental test given October 10, 1921, shows mental age 13^{0}, Intelligence Quotient 81. The mental age then appears to be constant, showing that there has been no mental growth while Intelligence Quotient has steadily lowered due to a higher chronological age.

From such an outline of history and behavior what then is the progress for results on mental tests aside from the Stanford-Binet? Using as representative tests the Porteus, Pintner-Paterson, Healy II, Trabue Completion tests, let us make a tentative prognosis bearing in mind the behavior noted and the unusual memory displayed. Such a tentative prognosis would indicate unquestionably a low score on the Porteus test. Such

lack of planning capacity and ability to meet and cope with situations could bring forth only a low score here. The Pintner-Paterson Performance median would also undoubtedly be low. His failure at employment in the paper concern (it being impossible to teach him to tie a package properly) would give evidence of this. On a few of the tests in this scale, however, he promises to give good scores. He should show special ability on the Knox cube test if general memory is any indication. The fact that he is alert and well oriented socially would also indicate a good score on Picture Completion. His excellent immediate and retentive memory should bring forth, too, a high score on the substitution test—that being essentially a test of easy learning and memory.

The prognosis for Healy II is extremely good. Mark's excellent social orientation and wide general knowledge gained from reading and fair education in addition to the fact that his early environment was New York City all indicate good prospects in this test.

The Completion tests present more or less of a problem in prognosis. The lack of judgment apparent in the patient should lower the result. On the other hand, his language proficiency and wide enough knowledge to grasp the general idea seem to indicate good results. Balancing the two, it would appear that the results on Completion tests should be fair if not good.

The actual results on the tests correlate fairly well with the prognosis. The performance median is 7 years, 8 months, quite as was expected. The score on Mare and Foal test was 5 years on errors, 7 years on time. Goddard Form Board gave mental age of 8 years. He was unable to complete Two Figure and Casuist boards, having no sense of form discrimination. He reversed the arm on Manikin test, a result which is a bit surprising in view of the fact that a good social orientation was assumed. He could not complete Feature Profile test. Scores on Ship Test and Picture Completion were considerably higher, 9.5 and 11 years respectively. Misplaced two upper adjacent pieces in Ship test and placed one absurdity in Picture Comple-

tion. As was expected he made his highest score on Knox cube test, mental age 12. A failure of attention rather than memory may be the reason for the score on this test being no higher. The assumption might have been made that he would have had a perfect score with such unusual memory, and with perfect attention such might easily have been the case. He failed the second movement in Adaptation Board, giving him a mental age of 7 years. The substitution test showed mental age of 8 years with three errors. On Healy A, 88 moves and 4½ seconds were required for completion, giving him a mental age of seven years.

The actual mental age on Porteus test was 5^6. He completed the five year test with no difficulty, failed the sixth year entirely and succeeded with seventh year on second trial. This result coincides with prognosis—emotional instability, poor judgment and lack of planning capacity are all shown up in results.

A mental age of 9^9 was the result of his work on the Healy II, showing fairly good social adaptation, quite in accordance with prognosis. In working he placed two absurdities as opposed to five logical placements. He was not particularly open to suggestion for he retained these logical placements even when questioned concerning them and gave logical reasons for each placement.

On Completion test Alpha and Beta Mark gained a mental age of 11^8 and 11 respectively with Intelligence Quotients of 73 and 68. Here we see a decided apparent inconsistency with results of accompanying tests. On tests which are supposedly tests of logical reasoning this boy who shows little actual ability along this line achieves a higher score than in any other tests. This inconsistency may however be alleviated in some measure when we take into consideration the fact that the completion test include, as we observed before, language ability and are objective rather than subjective. That is to say, the patient can reason fairly well on things outside of himself and outside of actual situations, but when brought face to face with realities fails.

The next test attempted by the patient was a so-called Quali-

tative test, unstandardized, wherein an attempt was made to test separately the qualities of attention, memory, comprehension, judgment and retentive memory. The maximum score in each dimension was 12, the idea being to compare in a group of patients one patient with another in respect to the various abilities. On this test Mark scored as follow Attention $9\frac{1}{2}$, Memory $10\frac{1}{2}$, Comprehension $11\frac{1}{2}$, Judgment $8\frac{3}{4}$, Retentive Memory 12. The poorest results then are on judgment and attention, highest on retentive memory. This maximum score on retentive memory has, however, been attained by many others of approximately the same or lower mental age without any special ability, so it shows no particular indication in this case. The failure on the tests of memory was in the auditory digit span. He repeated seven digits forward which places him in the fourteen year level according to Terman. He failed 8 digits forward. His comprehension was good, misconstruing as he did but one direction. We can not, nevertheless, immediately say that Mark's comprehension is as good or better than his memory. Though his score in this test is as high on comprehension as on memory, yet there have been no mental age standards set on these tests and the probable deduction is that if this were done, the mental age on the comprehension group would be lower than on the memory group. A low score on memory may indicate then as high if not higher mental age than a high score on comprehension. This seems consistent in view of the fact that the mental age on these tests of auditory memory goes as high as fourteen or sixteen years.

On the Pressey Primer scale which forms part of the tests on judgment Mark scores a mental age of 7^6. On Dot Pattern test he had 11 correct markings out of possible 25, completing the entire 25 in the given time. On Classification test he succeeded in 16 out of possible 25; on Form Board test passed 15 out of 25 and in Absurdities 15 out of possible 25 again. In each case he completed the entire 25 in the given time. He showed extreme scattering on failures in Dot Pattern test, failed 2nd pattern and passed 18th and 19th. He showed, too, much variation on Classification test. Form Board failures were

very consistent in that nearly all occurred as test grew progressively more difficult. In Absurdities the same consistency is shown. The mental ages on the four tests are 6^4, 8^9, 7^6, 8 respectively, composite mental age 7^8.

A question may arise then as to whether or not there is a discrepancy between the mental ages attained on the completion Alpha and Beta and that attained on the Primer Scale. Broadly speaking, all of these are tests of judgment, but they vary so much in kind that no actual discrepancy can be validly asserted. Tests I and III of the Primer scale (Dot Pattern and Form Board) are tests of Form Discrimination in a large measure, while tests II and IV (Comparison and Absurdities) are tests of Logical Relations. At the same time, the factor of memory and easy learning enters into the Form Board test and the factor of social orientation enters into the test of absurdities and each exerts a notable influence.

The composite mental age attained by Mark on the entire series of tests given (omitting the qualitative necessarily) is computed as follows:

WEIGHTING	TEST	M.A.	$W + g \times M.A.$
2	Performance	7–8	15–4
1	Beta	11	11
1	Alpha	11–8	11–8
1	Porteus	5–6	5–6
1	Healy II	9–9	9–9

Composite mental age 8 years, 5 months.

This composite rating is certainly much more satisfactory than the padded mental age of 12^{11} procured on Terman.

The mental tests then do not startlingly demonstrate any unusual capacity along one line, but do unquestionably show Mark's general social inadequacy. That is to say, the unusual memory present in this patient does not in itself alter the scores on the mental tests to an appreciable degree.

From the results of these tests and from behavior noted, it is quite apparent that Mark will always be a custodial case. Fairly

capable under direction, coöperative and tractable, easily adjusted as he is, he is of little care in the institution. Out of it, he would be totally at a loss, unable to cope with the slightest difficulty and would undoubtedly manifest to a decided degree his anti-social tendencies. Undecided then as the diagnosis is in the case, the fact remains that Mark possesses remarkable ability along one line, coupled with general unfitness to conduct himself efficiently in extra-institutional life.

NOTES AND NEWS

A. J. Snow, Consulting Psychologist to the Yellow Cab Company, Chicago, Ill., has recently been retained in the same capacity by Krenn and Dato, the largest real estate dealers in Chicago. His new duties consist of the organization of the personnel department and the devising a test for the selection of several thousand salemen. In addition to this the Yellow Cab Company has asked him to reorganize the training school for drivers and to organize a sales school with an annual budget of sixty-five thousand dollars.

Dr. Helen P. Woolley, Psychologist of the Merrill-Palmer School, Detroit, has been appointed Director of the Institute of Child Welfare Research, Teachers College, Columbia University, New York City. She takes the place of Dr. Otis W. Caldwell, Principal of the Lincoln School. In addition to this appointment Dr. Woolley has been appointed Professor of Education in the Faculty of Education.

Dr. Bess Cunningham has been elected Supervisor of the Educational Clinic and Assistant Professor of Education, Teachers College, Columbia University. Dr. Cunningham has served as Secretary of the Institute of Child Welfare Research, Teachers College.

Under the auspices of the Child Study Association of America, Inc., a conference will be held at the Hotel Waldorf, New York City, from October 26 to 28, in which will be discussed many topics of vital interest to parents and all who are interested in the problems of the family as it exists today. Among the speakers will be Dr. Bernard Glueck, psychiatrist; Dean Russell, Teachers College, New York City; Helen T. Woolley, the new Director of the Institute of Child Welfare Research, Teachers College; Miriam Van Waters, author of "Youth in Conflict"; and Dr. Beatrice Hinkle, author of "The Re-creating of the Individual." The public is invited to attend this conference.

BOOK REVIEWS

CHARLES W. ODELL. *An Annotated Bibliography Dealing with the Classification and Instruction of Pupils to Provide for Individual Differences.* Bulletin No. 16, 1923. Bureau of Educational Research, University of Illinois, Urbana. Pp. 50.

In this monograph we have three hundred forty-six titles listed. This list indicates something of the present interest of educators in the study of individual differences. But since the appearing of Odell's bibliography in November, 1923, two additional ones in the same general field have been printed. The first of these appeared in the Twenty-Third Yearbook of National Society for the Study of Education and the second in the Twenty-Fourth Yearbook of the same Society. The combined bibliographies record approximately thirteen hundred titles. There are relatively few duplications and when taken collectively they supply the reader with a fairly complete record of material relating to the topic of individual differences.

These bibliographies have the merit of being carefully annotated, thus greatly increasing their value. It would be a distinct contribution to this general field of education to have the three bibliographies combined and carefully indexed.

WALTER S. MONROE. *A Survey of the City Schools of Marion, Illinois.* Bulletin No. 21, 1924. Bureau of Educational Research, University of Illinois, Urbana. Pp. 60.

In this monograph we have the report of a survey of the school system of a small city. The findings of the survey staff are presented under the usual captions, including the city's investment in elementary education, the condition of buildings and equipment, the teaching staff and quality of instruction, the course of study and achievements of school children. In a final chapter certain specific recommendations are presented.

The report has the merit of being brief, setting forth only such facts as are beneficial to the community concerned. The recommendations are made with the thought of securing the maximum of improvement in the local system with the minimum of expenditure.

WALTER S. MONROE. *The Constant and Variable Errors of Educational Measurements.* Bulletin No. 15, 1923. Bureau of Educational Research, University of Illinois, Urbana. Pp. 30.

In this brief monograph the author discusses constant and variable errors in educational measurements, and points out their influence on such derived measures as the average, median, standard deviation, and coefficient of correlation. In the course of the discussion there is presented evidence of some five different sources of constant errors in educational measurements. These sources of errors may be summarized as follows: (1) The successive administrations of the same test or its equivalent form; (*a*) the lack of equivalence of duplicate forms of a test; (3) instruction functioning as coaching; (4) the subjective factor in the scoring of the tests; (5) the attitude of the pupils toward the tests. The author points out the possibility of constant error resulting from each of these sources and then adds that it is difficult to determine the exact magnitude of these errors. It is only possible to state that the error probably does not exceed a certain amount for we cannot be sure that only one source of error is operating in any single trial of a test.

A careful examination of the scores of any test will reveal evidence of the presence of variable errors of measurement. This becomes quite apparent when the same test is repeated after a short interval and the two scores of the same individual pupils are compared.

What should be the effect of a knowledge of the existence of such errors upon the movement for scientific measurement in education? It is not the author's purpose to advise the dicontinuance of the use of educational tests. It is rather to point out to those using such tests the limitations of the measures yielded by their use. It is certainly worth while for both the administrator and the school statistician to recognize the possible presence of one or both types of errors in every application of the standard tests.

WALTER MONROE AND DORA KEEN MOHLMAN. *Training in the Technique of Study*. Bulletin No. 20, 1924. Bureau of Educational Research, University of Illinois, Urbana. Pp. 68.

In recent years our attention has been directed to the conviction that study habits form an important educational objective. In this monograph we have presented a method of procedure looking toward training the child in good habits of study. After selecting a group of high school students who were doing poor work a careful study was made of the causes of low school standing. Certain types of defects were found to prevail. They may be summarized as follows:

1. Inability to read typical material in an effective manner.
2. Study conceived largely as a process of memorizing the textbook.
3. Failure to organize and summarize the material studied.
4. Failure to review at appropriate intervals.
5. Lack of regular time and place for study.
6. Failure to concentrate upon the assignment.

7. The practice of quitting a lesson before completing the task to the best ability of the child.

Following the analysis of each student's difficulties, remedial instruction was given for a period. The results of this remedial training, while not successful in every detail, encouraged the authors to express the belief that if such study procedure could be carried out systematically during the entire school year, improvement would be evident in the majority of cases. Should this prediction prove true, it would mean the salvaging of many of our high school failures, resulting in a social and economic gain.

A brief examination of how bright children study by means of interviews seem to show conclusively that the success of such children was due, in part, to the efficient methods of studying their lessons. While the study is not an exhaustive one and the findings not entirely satisfactory, the study opens a new responsibility for the class-room teacher and supervisor.

The monograph closes with a bibliography of more than forty titles carefully annotated, thus making an important contribution for any one interested in a similar study.

J. Crosby Chapman and George S. Counts. *Principles of Education*. Boston: Houghton Mifflin Company, 1924. Pp. 645.

The justification for this volume is found in a statement made in the introduction by the Editor: "There is danger that those in training today may grow up and pass out of our training institutions without gaining that sound grounding in the philosophy of the educative process which has been the great strength of the older generation of professional educators." The presence of such danger is certainly apparent to any one at all familiar with current educational literature and with the present tendency to emphasize "the newer engineering-type courses of instruction in education."

In organizing the subject-matter of the book, the authors use twenty-five important educational questions. Each of the larger questions is divided into a number of minor questions. This arrangement of the material lends itself admirably to classroom needs. The value of the book is further enlarged by including at the end of each chapter a serviceable collection of problems and exercises. Experience with the book warrants these statements.

The point of view of the authors cannot be expressed by stating the cardinal principles of any system of philosophy. It may be best presented in terms of what they conceive to be the large objective of education. "*This objective is that of inducting the child into the life of society and of training him in the use of the instrumentalities of civilization.*" They believe that a sound philosophy of education must be founded

upon human values and needs if it is to guide successfully a democratic society. Only when scientific procedure in education flows from such wholesome philosophy can the school advance toward its true goal. Such in brief is the point of view of the authors. While they have not given in detail the results of scientific investigations in the fields of psychology, sociology, and education, they have endeavored to incorporate in their book the spirit and fundamental truths of these researches. They have endeavored to express in a brief but a clear form the best that has been said regarding education from Plato to Wells. They have drawn from a wide group of authorities extending over the entire period of human history and representing the varied interpretations of life and its education.

WILLIS L. GARD,
Ohio University.

FRITZ WITTELS. *Sigmund Freud: His Personality, His Teaching, and His School.* Translated from the German by Eden and Cedar Paul. Dodd, Mead & Company. 287 pages. $3.50.

Herr Wittels, although he has been estranged from Sigmund Freud for years, is nevertheless an enthusiastic supporter of psychoanalysis and a thoroughgoing admirer of Freud. He speaks of Freud sometimes almost with awe. During the years of his estrangement he seems to have enshrouded the founder of psychoanalysis in a halo of romance. Freud to him is the Master, the overshadowing individuality, the Old Man of the primitive horde, a successor of Plato, one of those figures which "loom athwart the centuries." It is little wonder that Freud can write him the generally appreciative letter which forms the preface to the book. It is doubtful whether Herr Wittels, with such a profound admiration for Freud, can be the critical witness which he aspires to be.

His general attitude toward most of Freud's discoveries is illustrated by his enthusiasm for the Oedipus complex. The announcement of this complex, he says, "was acclaimed by those who were struck by the lightning of truth—and not by physicians alone, but by educationists, by serious-minded clerics, by sociologists, and, at length, by all who have a modicum of self-knowledge." The signs of the complex are so plain, in his opinion, "that it seems difficult to understand why the world had to wait until 1900 before a bold psychologist could discover this light for souls that have strayed from the path." These enthusiastic statements, however, bespeak only the general attitude of the author. He does not necessarily accept each and every pronouncement of Freud. For example, he does not answer Yes or No as to Freud's theory of the castration complex. The reader who is not an ardent Freudian may register a somewhat vigorous No—at least if he must depend for his evidence upon the information presented by Herr Wittels in his chapter on that subject.

The book, however, is valuable both for Freudians and non-Freudians. There is a vivid and entertaining account of the conflict of several strong personalities, among whom Freud is evidently the peer. The chapters on Adler, Jung, and Stekel show just where these well-known psychoanalysts broke with Freud, and just what each has contributed to psychoanalysis. There is also a clear account showing how Freud, step by step, built up his theories of the unconscious. The book, in other words, explains the inner workings of a movement which has become very powerful in our times.

B. L. JEFFERSON,
Ohio University.

MARION REX TRABUE. *Measuring the Results in Education.* American Book Company. Pp. 492.

Teachers have always tried to measure the results of their teaching, and the more progressive endeavor to use modern techniques. But the methods developed in the last few years by scientists have not been presented in an understandable way to the teacher. Either the scientist does not have the time, or he lacks the ability to interpret the results of his work so that the unskilled can use them.

Dr. Trabue happily combines the theory of scientific measurements with practical every-day problems which are familiar to the teacher in a way that can be understood by the average elementary school teacher. In the earlier chapters of the book he discusses the failure of school marks to measure effectively the results of education because of the lack of agreement of teachers in purpose, methods, and ability; the development of standard tests through the necessity of investigating and defending the conservatism of teachers; and the necessity of accuracy in securing the ages of pupils.

Statistical processes are begun in the fifth chapter, showing seriation, tabulations in graphic form in frequency tables and bar diagrams, and the calculation of the percentile points. Illustrations of types of measurement are used to emphasize the principles involved in each case. Tests for measuring spelling ability, the quality of handwriting, the speed and power in arithmetic, reading ability, and the quality in English composition, are discussed with clear directions for their use. In a clear graphic style the author shows the treatment of the data secured from test results, the calculation of measures of central tendency: the mean, the median, the mode; and measures of variability and dispersion: the mean, the median, the quartile, and the standard deviations; and the measurement of relationships: the coefficient of correlation.

It has been discovered that children differ greatly in their innate intellectual endowment, and this capacity, as well as the educational

standing of the pupils, can now be measured by standardized tests constructed especially for the purpose. By the use of these tests we may discover many grades of intelligence, get helpful information in the classification of children, be able to give them better educational and vocational guidance, and more nearly adapt instruction to their capacities and needs.

The author advises the use of tests that have been scientifically constructed and standardized if the teacher wishes to have a basis of comparison with what other schools are doing, and also be able to compare quality and difficulty.

Sixty-three tables and fifty illustrations are valuable features of the book in making the data and treatment of test results clear and understandable.

C. J. PATTEN. *The Passing of the Phantoms.* A Study of Evolutionary Psychology and Morals. E. P. Dutton & Company, 1925. Pp. 103.

The author discusses rather sketchily the doctrine of recapitulation, and also the development of the moral sense through evolution.

The first chapter suggests some evidences of the reality of evolution as found in vestigial sex-organs, atavistic myology, the evolution of the nervous system from the skin-layer of the embryo in various forms of life along with manifestations in the early life of the babe of inherited race experiences; and that the explanation of the differentiation of the human embryo in its later stages from its cousins of all living beings depends upon "long associated habits of the cellular elements of the embryo itself."

In the second chapter the author reports from his observation of pets evidences of the evolution of mental powers. A Kestrel listened with rapt attention when sung to; and she had the imaginative power to "conjure up in her mind vague mental pictures of something animate . . . . which she had probably once upon a time seen and which frightened her," when the author approached her coop with a "hard black felt hat on . . . ." A dog was easily beguiled into the belief that harmless inanimate objects may possess "evil spirits." A horse stopped for a moment to gaze at a large sun-flower hanging over the hedge in the twilight, then bolted because there was in his mind a dim idea "of the presence of something uncanny." A tiger, disturbed over the sight of a mouse is reported to have entertained a mental state related to a fairy quadruped very similar to our superstition concerning fairies. And the tendency to imagine Spiritual Essence in natural objects began in creatures lower than man, Darwin's dog showed that the ethical sense was developing when he asked himself whether it was right to permit a strange "living" agent to move an open parasol on the lawn.

The author continues this line of reasoning in the third chapter to

show the evolution of the moral sense from lower forms of life. Ants, which perhaps should rank next to man in the scale of intelligence, assist the feeble and are affectionate toward their fellows; gulls and terns exhibit sympathy for a wounded companion; and individual birds act as sentinels for the feeding flocks.

And there is no breach in continuity in evolution of morality from lower animals to man.

In the fourth chapter the author takes a fling at various theologies and dogmas, favors Agnosticism as an attitude (but does not adopt it), and finds that sympathy is the foundation stone for the moral sense. The evolution of the God-Devil ideas of man have come through the stages of animism, totemism, and astronomical myths. Many important myths and dogmas, such as the Resurrection of the Body, the Virgin Birth, of an Incarnate Deity in human form, had their origin chiefly in Solar Mythology. Those who believe in Super-Natural Beings are of the Superstitious Order, whose moral sense is permeated with "falsities and absurdities." But the non-superstitious man (few in number) is the salt of the earth because he accepts or rejects "statements according as his own reasoning faculty alone guides him."

There is a possibility of a case yet against evolution in the reader's mind, but not in the mind of the author.

J. R. GENTRY,
Ohio University.

TRUMAN LEE KELLEY. *Statistical Method.* New York: The Macmillan Company, 1923. Pp. xi + 390.

Yule's *Introduction to the Theory of Statistics* was published a decade and a half ago. During this period has taken place the greatest advance in the scientific aspects of education in its entire history. Hardly anyone taking an important part in this development has not acquired his knowledge of statistics to a considerable extent from a study of Yule's book. Indeed for more than a decade this work enjoyed a practically undisputed preëminence as a standard text in the subject. In 1923, however, appeared a work which seems destined to play for some years to come the rôle formerly played by Yule's *Introduction*. This new work is Truman Lee Kelley's *Statistical Method*.

In his introduction Kelley states that he designed the work chiefly for biologists, economists, educators, and psychologists. Probably the readers of this review will be interested in the work especially for its bearing on educational and psychological problems, particularly those concerned with tests. When Yule wrote his book this last great field of activity could hardly have been anticipated in its present state. Naturally many of the important statistical problems had not emerged. We find Yule's illustrations taken largely from economic and vital

statistics. In gratifying contrast to this (from a psychological point of view) we find Kelley making frequent and pointed reference to statistical principles and devices of value both to the builders and the users of tests. As an example of this, on page 174 appears a table showing the estimating potency corresponding to various correlation coefficients. From the point of view of theoretical statistics there is nothing particularly novel about this table. From the practical point of view, however, it is extremely important. For example, if the estimating potencies of the various correlation coefficients as shown in this table had been thoroughly realized by the makers and users of tests during the last fifteen years, things might now be quite different. Many of the extravagant claims for tests and the equally extravagant expectations of them would have been impossible. On the other hand the equally indiscriminate condemnation of all tests, which has been partly the result of the over-optimism just mentioned, might also have been avoided.

One of the best things in the book is the masterful manner in which the author has treated the various implications flowing from a fundamental expression originally derived by Spearman. This largely makes up Chapter IX which is entitled "Functions Involving Correlated Measures." It is not too much to say that every person concerned with tests in any important way should be familiar with this chapter. Indeed the same might be said of the greater part of the book. It is high time that it be recognized that experimental work on tests is not a job for an amateur. On the contrary, it is distinctly a task for an expert, and one of the indispensable qualifications of such an expert must be a thorough knowledge of statistics. Kelley's *Statistical Method* will undoubtedly play a dominant part in the statistical training of the test expert for some time to come.

CLARK L. HULL,
University of Wisconsin.

A. J. SNOW. *Psychology in Business Relations.* Chicago: A. W. Shaw Company, 1925.

In this book the psychological problems of business are divided into five groups: Psychology of the Consumer, Psychology in Marketing, Psychology in Advertising, Psychology in Selling, Psychology in Employment.

The discussion of the consumer comprises a presentation of the traditional classifications of human conduct and a section written for the benefit of the consumer, in which are given a number of 'prophylactics' which may be used in withstanding the wiles of modern marketers. For example: "The consumer has opportunity to familiarize himself with goods by consulting other courses than the dealer alone. It is his privilege to know quality and price, just as much as the merchant's. His

fellow-consumers have learned by experience, perhaps, from which he can profit, if he wishes. The man who has never owned an automobile, for instance, may profit by consulting his neighbor who does own a car before he makes his purchase." "The consumer's greatest defense, which cannot be overemphasized, is his knowledge of his own reactions in buying. By introspection, and by observing the reactions of fellow-consumers where the salesman uses certain methods, one may soon come to recognize the kinds of persuasion to which he ought to control his reactions. He must then learn to inhibit these reactions. Thus he guards not only against the tricks of the salesman, but also against his own impulsive actions."

The next three sections consist chiefly of general discussions of marketing situations, in great part condensed from the standard books on advertising and selling. A good deal of the material is of the 'commonsense' variety, such as: "It is important that the stock be as complete as possible." "The stock should be well located." "Good window and show-case display have important rôles. Feelings of pleasantness are produced through attractive displays of merchandise. Often desire for an article is induced by its setting in a show-case or window."

The fifth section deals with the difficulties involved in adjusting people to vocations; sketchy but clear treatment is accorded to the methods thus far developed for facilitating this adjustment: vocational analysis, tests, job specifications, and the like.

Publishers have long been vociferous in their appeals for a book on "Business Psychology." In view of the large number of courses of this title scheduled in the catalogs of Schools of Commerce and Colleges of Liberal Arts, one is tempted to regard these appeals as justified. One who tries to write such a book, however, encounters a number of perplexing questions: How much "general" and "theoretical" psychology to include; how much knowledge of an elementary sort can be expected from the reader; how can one write satisfactorily about the more subtle psychological relations in business without laying a considerable foundation of psychological theory? Then there is the circumstance that business relations are quite diverse; and while certain readers may be deeply interested in one phase like advertising, they may be uninterested in problems of employment; they can find the enlightenment they desire in the special books on advertising, so why should they buy a book on Business Psychology in general? The present volume is a valiant attempt to overcome these obstacles, and its reception will be watched with sympathetic interest.

The book calls forth several suggestions apropos of the writing of books of this character. Granting the real need of such summarized treatments of special phases of business, it would seem advantageous for an author to include some new material of his own. This will give

value to the book even in the hands of those who do not care to use the more general sections. Dr. Snow has furnished some such new material, reporting some of his investigations on rating and on the measurement of taxi drivers.

In the second place there is much to be said in favor of reproducing tables and graphs from the work of other investigators rather than merely making abstract generalizations. Business psychology needs content. A respectable body of facts are accruing, and these should be furnished in their scientific dress to the more or less avid public, if for no other reason, in order to drive home the necessity of using scientific methods, and in order to illustrate these methods. In this respect, the book before us might be improved, mention having already been made of the generalized and summarized nature of most of the discussions.

The book is commendably reticent in the claims it makes for the potency of psychology in business and, providing it gives a clear enough picture of the psychological mechanisms involved, it will surely not mislead. Readers who desire, and are able, to consult technical reports of investigations in business psychology are given a well-selected list of references. For the instructor who wishes to assign class exercises, a series of problems are set at the end of each chapter, though, unfortunately (from the standpoint of the impecunious instructor) they require the purchase of a separate book of problems compiled by the author.

Mr. Paterson, unless he is by now thoroughly hardened, will wince at the customary misspelling of his name; as will also Mr. Rugg. The excellent piece of advertising copy of Miss White, which serves as frontispiece, should have been censored as to the spelling of "cereal." On page 416 "In the ideas . . . ." should probably read "If the ideas . . . ." Other minor corrections that would be made by a fastidious reader will probably be made by the author before a reprinting.

HARRY D. KITSON,
Indiana University.

TWO PSYCHOLOGISTS

The latter part of the nineteenth century saw the rapid development in America of a new science, the science of physiological or experimental psychology. The stimulus in this as in so much of our higher scholarship of that period came from Germany. Most of the leaders have now passed away. The two—G. Stanley Hall and Hugo Münsterberg—here considered were both trained under Wundt, were both influential in applied psychology and were both extraordinary examples of the union in the same persons of insight with facility of expression. Both were to a large degree popularizers, it would not be wrong to call them journalists. In one important respect they differed. Münsterberg, like James and Ladd, never broke with the philosophical tradition.

Hall did. Münsterberg tried to keep his idealism and his science in separate compartments. To Hall as to Comte philosophy was one of the stages through which the race has passed or is passing. Like Comte he nevertheless had a philosophy of his own.

G. Stanley Hall. *Life and Confessions of a Psychologist.* New York: D. Appleton and Company, 1923. Pp. 623.

To G. Stanely Hall's own mind the most significant feature of his life as far as one may judge from this *Life and Confessions* was his rather unusual success in moulting the impenetrable shell of prejudice and ignorance in which life begins, his steady disillusionment, his progressive "eclaircissement," to borrow one of his own borrowed words. His work was the exorcism of dead faiths rather than the discovery of acceptable truths. He was too voracious for that. In his reading and in his intellectual hunger he was insatiable.

He had come far, this Puritan farm-lad who was now a leader of international standing in psychology and education. And yet his Puritan reserve persisted to the end and refused to let him reveal quite freely or to accept quite comfortably and naturally his religious position, his personal attitudes or the results of his own self-analysis. There is so often present in his revelations an element of strain, of labored bravura if not bravado. In this respect he is very modern indeed. "I am far older than my years," he writes (p. 596), "for I have laid aside more of the illusions and transcended more of the limitations with which I started than most. In the views I have attained of man, his place in nature, his origin and destiny, I believe I have become a riper product of the present stage of civilization than most of my contemporaries, have outgrown more superstitions, attained clearer insights, and have a deeper sense of peace with myself." It would not be easy to put such statements to any objective test. Elsewhere he says that all through life he was diffident before each new audience, that he was misunderstood, isolated and unable to be as friendly as he meant to be or to appear as genial as he really was. The laying aside of illusions gave pleasure but it also left scars.

Quite in line with the nature of his personal developments was the character of his influence in psychology. He was a purge and a great beginner but other men entered into his labors and made the positive contributions. And it is one of the poignant ironies of his life that of the many leaders in his field whom he inspired the most successful were those who diverged far from the paths and the topics that he approved.

Any man is free to reveal as much or as little of himself as he chooses or as he can. But repression at one point is liable to lead to over-expression at another. Was it not so here? Leaving the Williams of Mark Hopkins he spent a year at Union, associating the while with Beecher

and he narrowly missed becoming a minister. Indeed he did become a prophet and the lines of his prophecy were at least partly laid down by the age in which he lived.

Although he was but a boy when the *Origin of Species* came out, that book had become the scientific bible by the time he reached Germany. Earlier or later the result might have been different. Now in New York by reading and in Germany by personal contact he came under the spell of Darwin, Haeckel, Strauss, Ludwig, Flechsig and, in particular, Wundt. Thus he became an evolutionary and genetic psychologist. Thereafter his major interests were two, psychology and education, if these be not, on his own interpretation, only one.

His student days in Germany over, Dr. Hall was in 1881 "surprised and delighted to receive an invitation from the Johns Hopkins University, then the cynosure of all aspiring young professors throughout the country to deliver a course of twelve semi-public lectures on psychology. The University at that time was adding another story to our educational system. . . . . (He) understood that this opened the ultimate possibility of a chair and spent the entire summer in the work of preparation," and was rewarded in 1882 with the appointment to a professorship. Before this he had already held positions at Harvard and Antioch. Now his real career opened and he found himself in charge of the first American laboratory of psychology. It is not necessary to quote again the list of remarkable men who studied with him here or to name over the experimental studies which issued from this institution under his direction. Certainly the introduction of experimental methods and of the Wundtian standpoint was one of the greatest services that any man has performed for psychology in America. It was here also that he established *The American Journal of Psychology*, "the first in its field in English." The interesting and in part amusing story of its founding is told (pp. 227 ff.) in the *Life and Confessions*.

The close of the Johns Hopkins period marks also the close of his experimental work in psychology. At Clark, Dr. Sanford was placed in charge of the laboratory and after the administrative difficulties had been partially overcome and after Dr. Hall returned to teaching he devoted himself in the main to evolutionary and genetic aspects of psychology. Psychogenesis is the name he gave to his basic course at Clark and the outline of it (pp. 363 ff.) shows how all-inclusive, pansophic, it was. But he justifies its character by saying that "interest, like steam in an engine, must be developed over a large surface, although when put to work it has to be applied to a small one." Whether this is good educational psychology would seem to depend upon the emphasis and the wisdom that are applied to the latter part of the statement. Undoubtedly his method brought out a large number of splendid workers in psychology and education; it would be interesting to inquire into the number that it spoiled.

Almost three hundred titles are required to cover the sheaf of work garnered by Dr. Hall in fifty years of professional activity. Even this is not a complete bibliography, of course. The larger number of these productions are articles, frequently famous articles like *The Study of a Sand Pile, A Study of Children's Collections* or *The Contents of Children's Minds*. About a dozen sizable volumes issued from his desk, two of them—the *Adolescence* and the *Educational Problems*—each containing approximately fourteen hundred pages.

It is probably not unfair to say that he had no systematic view in psychology. He proposed no closed scheme and he even seemed to react against exact methods. His interest was in growth and youth; and Youth he tried to serve. "My heart lives in the future and in this sense I am younger than youth itself, the nature of which I would chiefly understand and appeal to."

Everyone to whom the reviewer has submitted the question has assented to the tonic quality of the *Life and Confessions*. Is not this, his vigor and enthusiasm and youth, the secret of the greatness of G. Stanley Hall? The spade work had to be done. It was done by disciples. He would inspire.

MARGARET MÜNSTERBERG. *Hugo Munsterberg: His Life and Work*. New York: D. Appleton and Company, 1922. Pp. 449.

When Agassiz at thirty-nine came to America he had already made his great scientific reputation. During the remaining twenty-seven years of his prime he became a marvelously popular teacher and he founded a great museum but his scientific discoveries were not numerous. His eager audiences and his boundless opportunities for mere collecting distracted him from those intensive studies by which, chiefly, science is extended. There is some evidence, not indeed demonstrative but still significant, that America spoiled Agassiz as a scientist.

A like comparison may be made in regard to Münsterberg. He came earlier in his life, at twenty-nine, and without having a comparable amount of completed work behind him. But like G. Stanley Hall he had worked with Wundt, had been thoroughly trained in physiological psychology and his published work was full of promise and had received the enthusiastic approval of William James. Once settled in Quincy Street, Cambridge, opposite the large, old residence of Mrs. Louis Agassiz, his teaching schedule, the popular audiences always waiting to be interested but not always capable of receiving instruction, his fatal facility with voice and pen and a certain very human love of applause had their way with him; but not before he had done a creditable amount of some of the best work in psychology, pure and applied.

It is easy to fling the charge of superficiality. It is often supposed that one can not be both widely popular and profound. And this tradi-

tion has some virtue but there are exceptions and Münsterberg was one of them. He was both popular and profound although not often in the same book perhaps. The best of him is in the *Beitrage*, the *Grundzüge*, the *Eternal Values* and the laboratory studies, all of them scholarly and scientific works. The *Eternal Values* has been called "an idealist's confession of faith." It and the *Grundzüge* show the dualism and parallelism which were basic postulates of his world-view.

The breadth of his interests was remarkable. He was concerned with music, poetry and art, with international relations as well as with philosophy and psychology. It may be that it was because of this breadth that he understood as have few others the conditions and the limitations of scientific method. In the end, however, it would seem that he undertook too much. The curse of popularizing is this that once a man does very much of it he will not be allowed to do anything else. His fate resembles that of the literary artist who writes a funny book and whose public ever after compels him "to write as funny as he can." The story of his literary and platform activities reads like a romance. His later volumes were mostly propagandist in character. Such are *On the Witness Stand*, *Psychotherapy*, *Psychology and Industrial Efficiency*, *Vocation and Learning* and a host of articles in magazines and in the Sunday newspapers. Here he was exploiting the new psychology. Even here he was instrumental in furthering modern vocational psychology and helped to pave the way for the achievements of the psychologists in the army.

Münsterberg was not entirely fortunate in his day and generation at Harvard. He came in complacent 1892 when William James could calmly, and perhaps fairly, inform him that Harvard was the best university in America. Even in those days it is said that there was a group of Brahmans who did not understand him, refused to overlook his foibles and his vanities and who even tried to embarrass him. And the wild animosities of 1916–1917 worked a virtual crucifixion. At the examination of a graduate student for a higher degree a colleague and former friend, a leading American thinker, sat during the whole period next to Münsterberg without a sign of recognition. Probably no one any longer believes him to have been a political agent but his career shows how hard it is to be friendly to both of two warring nations.

Perhaps this book also would be more convincing if it did not so clearly try to make out a favorable case for its subject. Biographies made in the family almost invariably suffer from this fault. But the volume is well-written, it presents the necessary facts for an understanding of Münsterberg's career and in the appendix there is an adequate summary of his psychological and philosophical writings.

H. G. Good,
Ohio University.

ROBERT H. LOWIE. *Primitive Religion.* New York: Boni and Liveright, 1924. 346 pp. $3.50.

Primitive Religion is a comparative study of primitive religion, psychological in point of view, and undertaken for the purpose of finding the "least common denominator in all religious phenomena." Professor Lowie defines religion as a "sense of something transcending the expected or natural, a sense of the Extraordinary, Mysterious, or Supernatural," yet he would have it understood that this is "but a minimum definition of the psychological correlates of religion. . . . ." Following Drs. Marett and Goldenweiser, the author discovers the sense of the supernatural as the fundamental, common minimal element in religion, "not in the arbitrary division of the Sacred from the Profane but in the differential response to normal and abnormal stimuli, in the *spontaneous* distinction thus created between Natural and Supernatural, which does not require any pre-existing abstract formulation of 'nature.' The response is that of amazement and awe; and its source is the Supernatural, Extraordinary, Weird, Sacred, Holy, Divine." In a word, that is labelled religious which in the subject is an attitude of wonder, amazement, fear and awe, and which surrounds its objective correlates, the stimuli, with a strong affective element involving the claims of reverence, respect or worship.

This definition is based chiefly on the study of the psychological content of four contemporary primitive religions which are believed to be representative: the Crow Indians of eastern Montana, the Ekoi tribe on the west coast of Africa, the Bukaua with their neighbors, the Jabim and Tami of New Guinea, and the Polynesians. Having acquired an intimate knowledge of the beliefs and practices of these tribes, the author seeks to interpret these beliefs and practices as the votaries themselves view them. Part II, a *Critique of Theories*, is a critical comparison and evaluation of the author's conception of religion with the Animism of Tylor, the Magic of Frazer, and the Collectivism of Durkheim. Part III, headed *Historical and Psychological Aspects*, is a somewhat disconnected group of essays in which the author further seeks to justify his theory.

The reviewer is much in doubt whether Professor Lowie's source material for the development of even a minimal definition of religion is sufficiently diverse and representative. Why limit the source material to a few contemporary primitive religions? Why not include past religions as well as present? and why not include the history of a few great religions as well as religious phenomena as found in different stages of human civilization and culture? The language, too, in many cases is unnecessarily technical, certainly beyond the powers of a beginner in comparative religion. One is favorably impressed, however, with the author's scholarly treatment of the religions selected. This is his real

contribution to comparative religion. Extremely pertinent is Professor Lowie's last word which is an emphatic caution (1) to those who would devise their definition of religion by *a priori* methods without factual data gained through painstaking observation and research; (2) to those who in their zeal for simplification of the diverse religious phenomena tend to overlook or ignore important individual differences; and (3) to those who criticise any definition of religion before inquiring into the point of view or purpose which has served as an organizing principle. Perhaps there is no single adequate definition of religion.

WALTER S. GAMERTSFELDER,
Ohio University.

NEW BOOKS AND PAMPHLETS RECEIVED[1]

Books and pamphlets for review should be sent to James P. Porter, Department of Psychology, Ohio University, Athens, Ohio.

Clinical Psychology. Louis E. Bisch. The Williams and Wilkins Company, Baltimore, Md. Price $3.00. 346 pp.

Collected Papers of Sigm. Freud. Vol. III. The Hogarth Press, 52 Tavistock Square, London, W. C. 1. Pp. 605.

Constitution at a Glance, The. Henry B. Hazard and Margaret D. Moore. Henry B. Hazard, Lock Box 1919, Washington, D. C. Price $.75.

Crisis in Psychology. Hans Driesch. Princeton University Press, Princeton, N. J. Price $2.50. 275 pp.

Education as the Psychologist Sees It. W. B. Pillsbury. The Macmillan Company, New York, 1925. Pp. 342.

Improving Rural School Instruction and Supervision in Colorado. Joseph H. Shriber and L. Thomas Hopkins. University of Colorado Bulletin, Vol. XXV, No. 1. Boulder, Colorado. Pp. 99.

Linking Science and Industry. H. S. Person, E. K. Hall and others; edited by Henry C. Metcalf. The Williams and Wilkins Company, Baltimore, Md. Price $3.50. 206 pp.

Mental Growth of Children. Buford J. Johnson. E. P. Dutton and Company, New York. Price $3.00. 160 pp.

l'Odorat: Encyclopedie Scientifique. H. Zwaardemaker. Gaston Doin, Editeur, 8, Place de l'Odeon, Paris. 305 pp.

Primer of Graphics and Statistics for Teachers. Harold Rugg. Houghton Mifflin Company, New York. Price $1.60. 142 pp.

Professional Secondary Education in Teachers Colleges. Alfred Lawrence Hall-Quest. Columbia University Contributions to Education, No. 169. Columbia University, New York.

Program for Higher Education in the Church of the Brethren. John Samuel Noffsinger. Columbia University Contributions to Education, No. 172. Columbia University, New York City.

Psychology in Advertising. Albert T. Poffenberger. A. W. Shaw Company, New York. 632 pp.

[1] Mention here does not preclude further comment.

Report of Statistics of Manufacturers for 1921: Massachusetts. The Secretary of the Commonwealth, State House, Boston 9, Mass. 100 pp.

Social Psychology. KNIGHT DUNLAP. The Williams and Wilkins Company, Baltimore, Md. Price $4.00. 261 pp.

A Study in the Psychology of Learning in Geometry. WINONA M. PERRY. Columbia University Contributions to Education, No. 179. Columbia University, New York.

A Study of Learning and Retention in Young Children. LOIS HAYDEN MEEK. Columbia University Contributions to Education, No. 164. Columbia University, New York.

Trancendental Values. R. P. BYERS. Richard G. Badger, Publisher, Boston, Mass. 69 pp.

PUBLICATIONS ISSUED BY THE BUREAU OF EDUCATION, DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C.

Courses in Rural Education Offered in Universities, Colleges, and Normal Schools. KATHERINE M. COOK. Rural School Leaflet No. 37, March, 1925. Price 5 cents. 18 pp.

High School Education of the Farm Population in Selected States. E. E. WINDES. Bulletin No. 6, 1925. 24 pp.

Important State Laws Relating to Education, 1922–1923. WILLIAM R. HOOD. Bulletin No. 2, 1925.

Kindergarten Legislation. NINA C. VANDEWALKER. Bulletin No. 7, 1925. 32 pp.

Per Capita Costs in City Schools, 1923–1924. FRANK M. PHILLIPS. Statistical Circular No. 4, March, 1925. 7 pp.

Record of Current Educational Publications. JOHN D. WOLCOTT. Bulletin No. 14, 1925. 59 pp.

Statistics of City School Systems, 1921–1922. FRANK M. PHILLIPS. Bulletin No. 34, 1924. 222 pp.

Visual Education and the St. Louis School Museum. CARL G. RATHMANN. Bulletin No. 39, 1924. 36 pp.

Directory of American Psychological Periodicals

American Journal of Psychology—Ithaca, N. Y.: Morrill Hall.
Subscription $6.50. 600 pages annually. Edited by E. B. Titchener.
Quarterly. General and experimental psychology. Founded 1887.

The Pedagogical Seminary and Journal of Genetic Psychology—Worcester, Mass.: Clark University. Subscription $7. 700 pages annually. Edited by Carl Murchison and an international co-operating board. Quarterly.
Child behavior, differential and genetic psychology. Founded 1891.

Psychological Review—Princeton, N. J.: Psychological Review Company.
Subscription $4.25. 480 pages annually.
Bi-monthly. General. Founded 1894. Edited by Howard C. Warren.

Psychological Bulletin—Princeton, N. J.: Psychological Review Company.
Subscription $5. 720 pages annually. Psychological literature.
Monthly. Founded 1904. Edited by Samuel W. Fernberger.

Psychological Monographs—Princeton, N. J.: Psychological Review Company.
Subscription $5.50 per vol. 500 pp. Founded 1895. Ed. by Shepherd I. Franz.
Published without fixed dates, each issue one or more researches.

Psychological Index—Princeton, N. J.: Psychological Review Company.
Subscription $1.50. 200 pp. Founded 1895. Edited by Madison Bentley.
An annual bibliography of psychological literature.

Journal of Philosophy—New York: 515 W. 116th St.
Subscription $4. 728 pages per volume. Founded 1904.
Bi-weekly. Edited by F. J. E. Woodbridge and Wendell T. Bush.

Archives of Psychology—Sub-Station 84, N. Y.: Archives of Psychology.
Subscription $5. 500 pp. ann. Founded 1906. Ed. by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology and Social Psychology—Albany, N. Y.
Subscription $5. Boyd Printing and Publishing Co. Edited by Morton Prince in co-operation with Floyd H. Allport.
Quarterly. 432 pages annually. Founded 1906. Abnormal and Social.

Psychological Clinic—Philadelphia: Psychological Clinic Press.
Subscription $2.50. 288 pages. Ed. by Lightner Witmer. Founded 1907.
Without fixed dates (9 numbers). Orthogenics, psychology, hygiene.

Training School Bulletin—Vineland, N. J.: The Training School.
Subscription $1. 160 pp. ann. Ed. by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Comparative Psychology Monographs—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages per volume. Edited by W. S. Hunter.
Published without fixed dates, each number a single research.

Psychoanalytic Review—Washington, D. C.: 3617 10th St., N. W.
Subscription $6. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Ed. by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology—Princeton, N. J.
Psychological Review Company. 480 pages annually. Experimental.
Subscription $4.25. Founded 1916. Bi-monthly. Ed. by John B. Watson.

Journal of Applied Psychology—Baltimore: Williams & Wilkins Co.
Subscription $5. 400 pages annually. Founded 1917.
Quarterly. Edited by James P. Porter and William F. Book.

Journal of Comparative Psychology—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages annually. Founded 1921.
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